

# ON A COLLECTION OF TRICHOPTERA FROM THE INDIAN MUSEUM.

## PART II.—INTEGRIPALPIA.<sup>1</sup>

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This second part of the paper deals with the collection of the suborder Integripalpia in the Indian Museum. Of this suborder only about 45 species have been described so far from Continental India. The material of the Indian Museum increases the number of species of Integripalpia known from Continental India to 79; of these 31 species proved to be new. A few forms from Ceylon are also recorded in this paper.

At the end of this paper I give the description of a new species of the suborder Annulipalpia and some corrigenda and addenda to the first part. The Indian fauna appears to be rich and composite, and further new species will be found as the various areas are more intensively explored. The southern and western parts of India particularly are not sufficiently explored so far and new records from these regions will be valuable.

### Family CALAMOCERATIDAE.

#### **Ganonema** McLach.

#### **Ganonema salsum** Betten.

(Text-figs. 1, 2).

1909. *Ganonema salsum*, Betten, *Rec. Ind. Mus.* III, p. 238, pl. xvi, figs. 14-17 (Assam).  
2 ♂, 2 ♀. Darjeeling Distr., Pashok, 3,500 ft., 1-12.x.17; F. H. Gravely (in spirit). Also 2 larvae and pupae.  
2 ♂, ♀. Kumaon Hills, Bhowali, bushes and trees on the sides of the stream below Sanitarium, 12.v.30; H. S. Pruthi (dry).  
♂. Kumaon Hills, sides of the Deo-Gad stream and the forests S.W. of Pinath, 7 miles from Kausani, Almora distr., 1.vi.30; H. S. Pruthi.  
♂. Kumaon Hills. Forests round Mahasekhan Forest House, ca. 6,500 ft., 5 miles from Bhowali, 13.v.30; H. S. Pruthi.  
♀. Kumaon Hills, Dalmati, Almora distr., sides of the Kali Nala, below the Forest Bungalow, 21-22.v.30; H. S. Pruthi.  
♀. Assam-Bhutan Frontier, Boirakund, Darrang distr., 18-22.x.12; S. W. Kemp.  
♂. Garhwal distr., Gular, the mouth of a spring, 15.v.15.

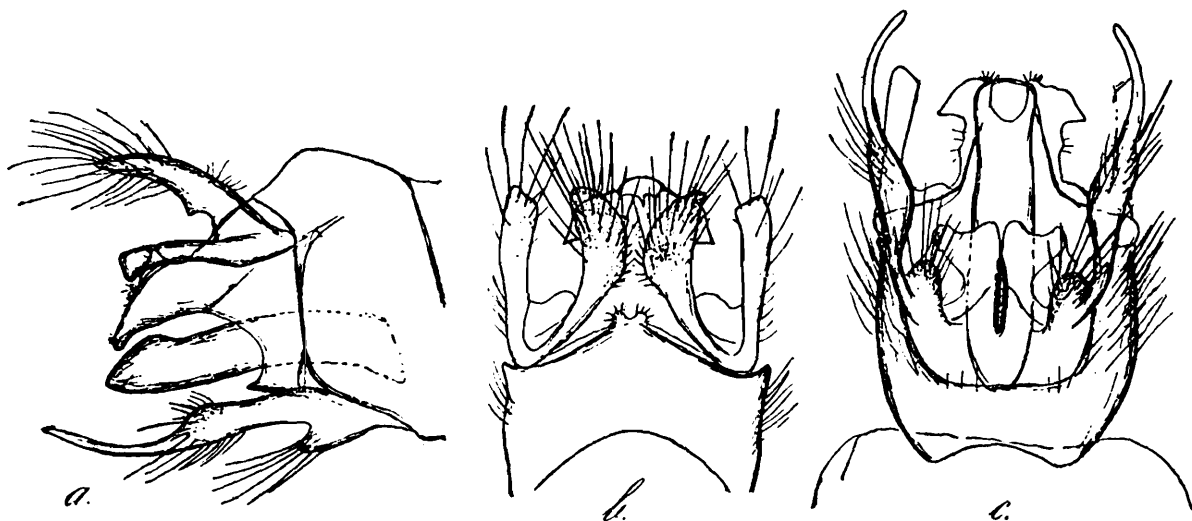
Head and thorax rufous brownish, with yellowish rufous hairs; antennae yellow, with narrow brown annulations; palpi clothed with yellowish rufous pubescence. Legs brownish-yellow clothed with yellow hairs. Posterior tibiae in ♂ bearing a brush of long yellowish hairs behind. Anterior wings pale brownish, broad, with obliquely truncated apical edge, clothed with yellowish rufous hairs; venation, as in Betten's figure 14, pl. xvi. In the posterior wings fork 1 begins

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<sup>1</sup> The first part of this series was published in this journal, vol. XXXVII, pt. ii, pp. 93-209 (1935).

somewhat earlier than in Betten's fig. 14, but after the 3rd fork; colouring somewhat paler than that of the forewings.

♂. 9th segment broad, somewhat narrowed beneath; tergite with a shallow triangular projection, ending in two minute median tubercles above; sternite narrower than tergite. Preanal appendages divided up to their bases into two thick stick-shaped processes, united at their bases; the upper process, if seen from above, directed upwards and inwards; distal portion of the upper branch somewhat plate-like, narrow from side, dilated from above, hairy.



TEXT-FIG. 1, a-c.—*Ganonema salsum* Betten, ♂; genital appendages from side (a), from above (b) and from beneath (c).

10th segment: distal portion triangular from side, separated from the basal by an excision above; end somewhat extended downwards. Seen from above, 10th segment is broad in its basal part, then suddenly narrowed; apical portion with a deep rounded excision divided into two lobes, at sides dilated into two triangular projections. Penis straight, cylindrical, under it are situated two broad pale plates, separated from each other by a narrow median fissure.

Pedes genitales long and rather slender, directed backwards; proximal half, which may be considered as representing the basal joint, is provided internally and ventrally with a rounded hairy thickening at its base; distal portion of the basal joint is also somewhat thickened



TEXT-FIG. 2, a-c.—*Ganonema salsum* Betten, ♀; last segments of abdomen from side (a), from above (b) and from beneath (c).

(if seen from beneath) and is beset with long hairs. Second joint slender, pale, somewhat arcuate, not separated from the basal one.

♀. 9th tergite truncated and behind it there is a narrow elongated lobe, belonging to the 10th segment ; 9th sternite broad, with a median impression subdivided into two side portions. Preanal appendages short, rounded, hairy ; ventrally between them is a broad, rounded plate belonging to the 10th segment ; genital orifice situated behind the 9th sternite.

*Remarks.*—*Ganonema salsum* is, apparently, not uncommon in North India ; it differs from all other species of the genus in the two-branched preanal appendages of the males.

From Assam are known also *G. brunneum* Ulm. and *G. longipenne* Mart., but these species are not represented in the present collection.

### **Asotocerus** McLach.

#### **Asotocerus fuscipennis** Albarda.

1887. *Asotocerus fuscipennis*, Albarda, *Veth's Midden-Sumatra*, IV, pt. 5, p. 17, pl. v, fig. 1.

1909. *Asotocerus fuscipennis*, Betten, *Rec. Ind. Mus.* III, p. 239, pl. xvii, figs. 1-3.

♂. Kumaon Hills, sides of the Deo-Gad stream and the forests S.W. of Pinath, 7 miles from Kausani, Almora distr., 1.vi.30 ; H. S. Pruthi.

♂. S. Shan States, swamp at head of Inle Lake, Yawngnaw State, 20.ii.17 ; F. H. Gravely.

♂. S. India, Kodaikanal, 6,900 ft., Palni Hills, viii.22, at light ; S. W. Kemp.

♀. S. Shan States, Inle Lake, Yawngnaw State, 3,000 ft., 18-23. ii. 17 ; F. H. Gravely.

The wing venation and the shape of the ♂ genitalia in the first and in the second specimens being very similar to Betten's figures 1-3, pl. xvii, I believe that they belong to this species.

Length of body in the second specimen is 9 mm. The third specimen from Kodaikanal, S. India is larger (length of body 10.2 mm.), and its venation is somewhat different. In the anterior wings  $RS_1$  derives from the discoidal cell somewhat later, fork 2 is angulate at base ; in the posterior wings the pedicel of the first apical fork is longer, and the bases of forks 1, 2 and 3 are situated nearer to each other than in the other two specimens or in Betten's figure 1. However, the structure of the ♂ genitalia, and in particular the shape of the 10th segment are similar to those in *A. fuscipennis*. I, therefore, refer this specimen also to *A. fuscipennis* ; it perhaps represents a distinct variety.

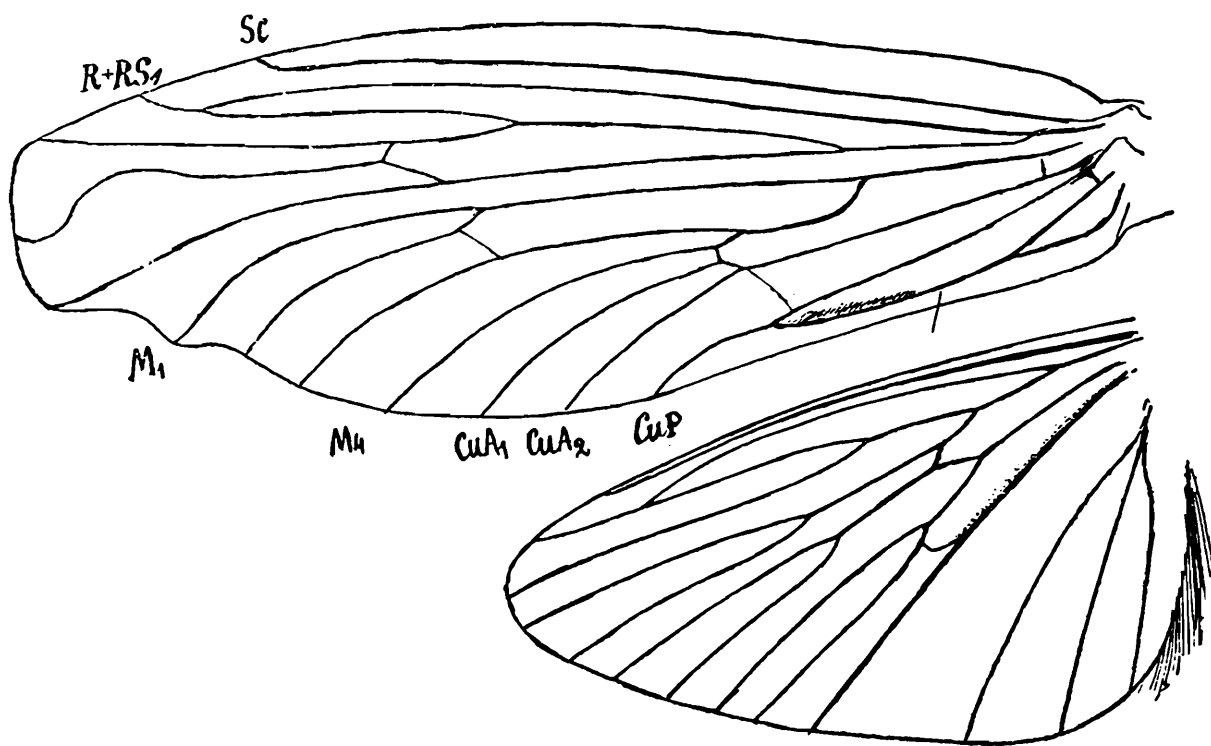
#### **Asotocerus flexuosus**, sp. nov.

(Text-figs. 3, 4.)

♂. Peninsular India, Castle Rock, N. Kanara distr., x.16 ; S. W. Kemp (in spirit).

Head and thorax yellow, antennae pale yellow, with black annulations ; palpi pale. Anterior wings brownish in the anterior parts, paler in the middle, clothed with rufous hairs ; apex truncated, hind-apical

margin somewhat sinuate, forming a convexity at the end of  $M_1$ , separated by two concavities; R united in its end portion with  $RS_1$ ; DC long, narrow;  $RS_1$  arising from it at the base of three-fourths of its length; area between  $RS_2$  and  $RS_4$  rather broad, and  $RS_3$  distinctly curved in this region. MC beginning at same level with DC and nearly as long; CuP pale, feeble,  $A_1$  distinct,  $A_3$  present,  $A_2$  apparently lacking or



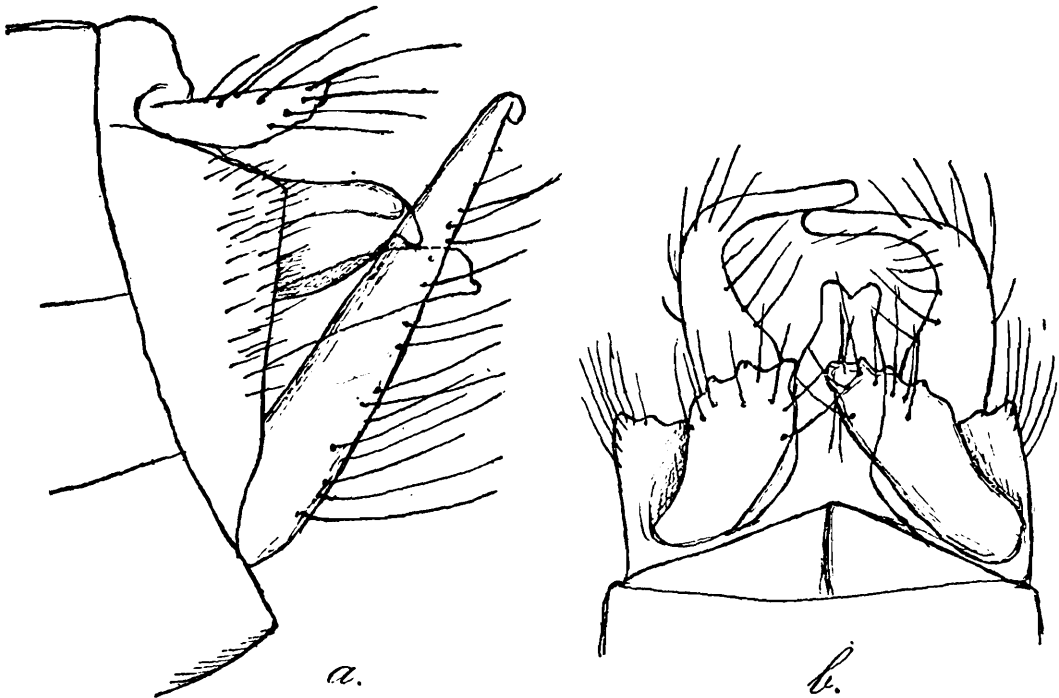
TEXT-FIG. 3.—*Asotocerus flexuosus*, sp. nov., ♂; venation of fore- and hind-wings.

united with  $A_1$ . Posterior wings as broad as the anterior, clothed with yellowish rufous hairs;  $RS_1+2$  dividing early, fork 1 much longer than the 2nd, cross vein rs-m oblique, 3rd fork beginning at same level as the 2nd; the so-called—CuA<sub>1</sub> represents here the hind branch of the long fork 4; CuA strong, practically simple, accompanied anteriorly by a brownish chitinated streak<sup>1</sup>; cross vein m-cu curved. Jugal region very narrow, and I can detect no arcuate vein here; on its inner margin a set of long thin brownish hairs. Abdomen brownish above, pale beneath.

♂. Genital appendages resembling those of *Asotocerus ochraceellus* McLach. and of *Asotocerus sinuatus*, sp. nov. 9th segment forming two broad low triangular side pieces; tergite narrow, but forming a convexity above. Appendices preanales rather short but broad if seen from above; they are directed somewhat inwards and arched above, with several bristles; their hind margin is sinuate. 10th segment short; seen from above it is somewhat dilated in the middle, then constricted and at its end subdivided into two lobes; median portion raised upwards; seen from side it is broader; apex attenuated and curved somewhat downwards. Pedes genitales long, ascending; distal portions,

<sup>1</sup> I believe this streak to be a remnant of MP, which existed in the ancestral types of Trichoptera; it is preserved mainly in the genus *Setodes* and in some other genera.

representing second joints, united with the basal ones, slender and curved inwards. Penis straight.



TEXT-FIG. 4, a, b.—*Asotocerus flexuosus*, sp. nov., ♂; genital appendages from side (a) and from above (b).

Length of body 7.5 mm., length of anterior wings 13 mm.

*Remarks.*—This species is allied to *A. sinuatus*, sp. nov., but is easily distinguished by its arcuate  $RS_3$ .

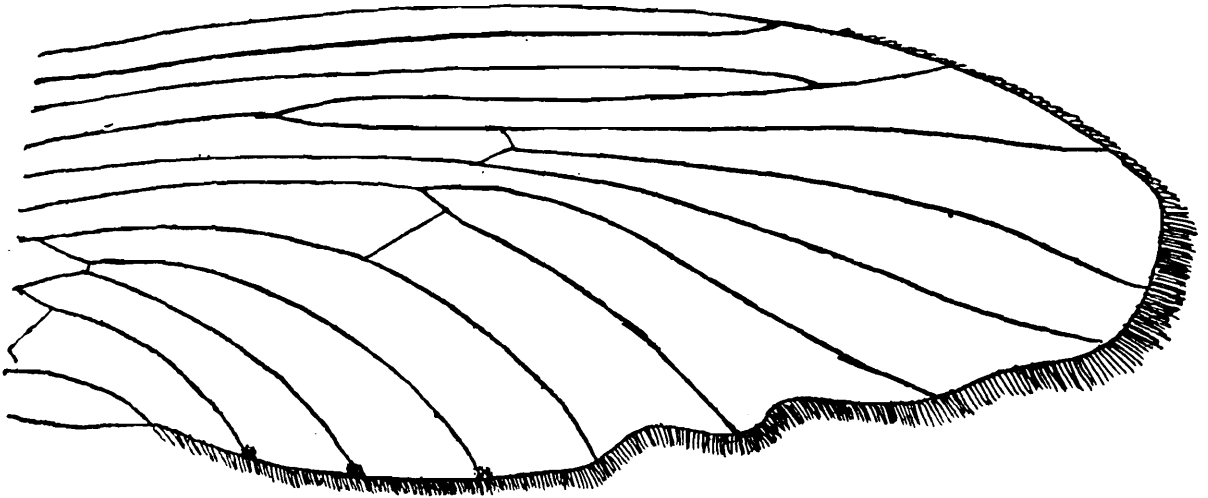
### ***Asotocerus sinuatus*, sp. nov.**

(Text-figs. 5, 6.)

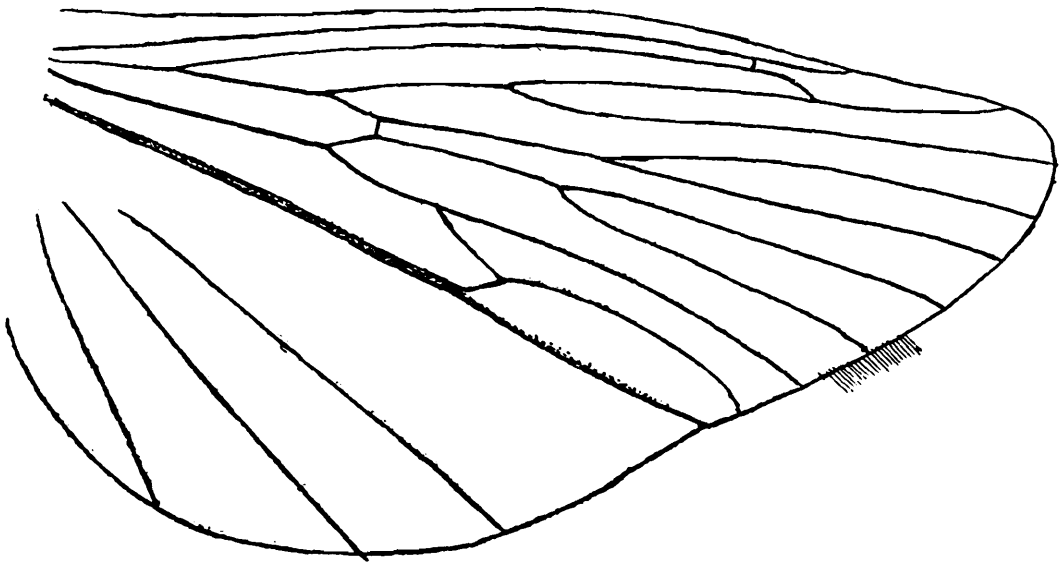
♂. Nilgiri Hills, 3,000 ft., ix.10; H. L. Andrews (dry specimens).

Head and the basal joint of antennae yellowish rufous, clothed with concolorous hairs; antennae yellow, narrowly annulated with black; palpi yellowish. Thorax brownish, pronotum and tegulae yellow, bearing long yellowish hairs; metanotum paler, yellowish; coxae in the pro- and mesothorax dark brownish, with long pale hairs; posterior coxae yellowish; legs yellow or yellowish, anterior femora brownish; posterior tibiae bearing long pale hairs, outstanding posteriorly. Anterior wings elongated, not curved backwards, with apex truncated, densely clothed with yellow rufous hairs; fringe brownish, but at the ends of veins there are also yellow hairs. At the ends of  $CuP$ ,  $CuA_1$ ,  $CuA_2$ ,  $M_4$  and  $M_3$  blackish spots; hind apical margin sinuate, forming concavities between  $M_3$  and  $M_2$ ,  $M_2$  and  $M_1$ ,  $M_1$  and  $RS_4$ ; areas between  $RS_2$  and  $RS_3$ ,  $RS_3$  and  $RS_4$ ,  $RS_4$  and  $M_1$ ,  $CuA$  and  $CuP$  forming longitudinal pale greyish streaks, which are almost nude, clothed with few sparsely arranged hairs; similar, but short streak may be seen between  $M_1$  and  $M_2$ ; discoidal cell extraordinarily long and narrow,

RS deriving at  $\frac{2}{3}$  from its base; 3rd fork triangular at its base, the 4th long, curved; MC but a little shorter than DC,  $M_4$  arising at  $\frac{2}{5}$  from



TEXT-FIG. 5.—*Asotocerus sinuatus*, sp. nov., ♂; distal part of fore-wing.



TEXT-FIG. 6.—*Asotocerus sinuatus*, sp. nov., ♂; posterior wing.

its base. Venation of posterior wings resembling that of *A. flexuosus*, sp. nov.; fork 1 beginning earlier than fork 2, basal portions of  $RS_3+4$  and  $M_1+2$  connected by a transverse cross vein;  $CuA_1$  shorter than in *A. flexuosus*, sp. nov., arcuate<sup>1</sup>, connected by an elongated oblique vein<sup>2</sup> with  $M_3+4$ ;  $CuA$  strong, with a narrow brownish streak before it; membrane of the posterior wings brownish, clothed with sparse brownish hairs. Abdomen brownish.

♂. Structure of male genital appendages resembling that of *A. flexuosus*, sp. nov.; 10th segment also somewhat dilated in its middle, above, and at its end divided into two small oval lobes.

Length of body 10 mm., that of anterior wings 17 mm.

*Remarks.*—This species is allied to *A. flexuosus*, sp. nov., differing mainly in the wing venation and in its larger size.

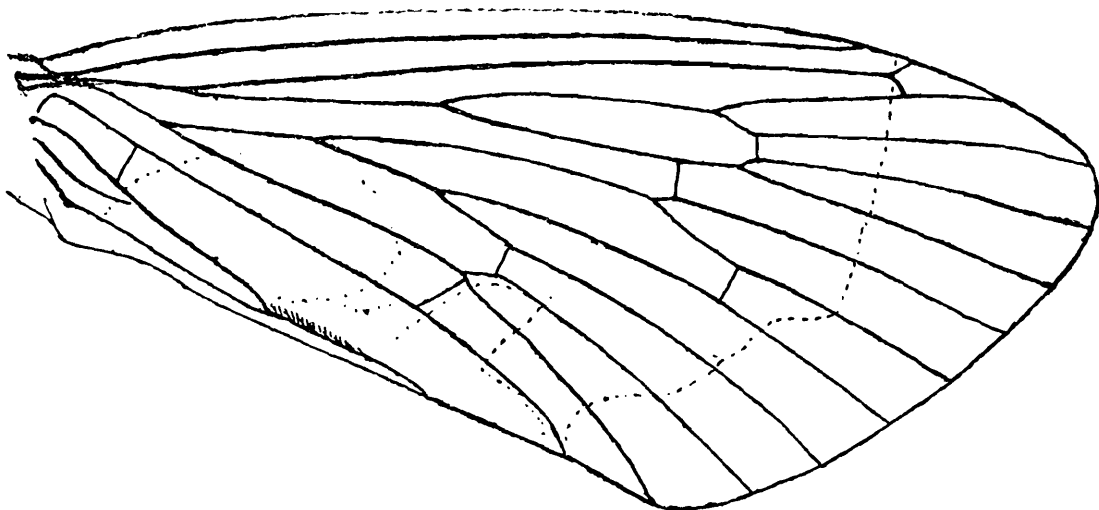
<sup>1</sup> This vein is morphologically  $M_4$ , as in *Asotocerus flexuosus*, sp. nov.

<sup>2</sup> This oblique vein certainly represents the basal part of  $M_4$ .

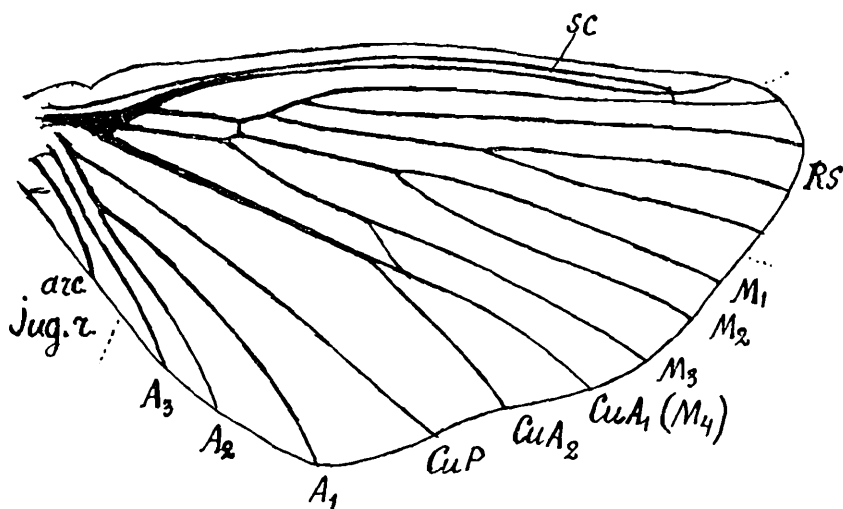
**Anisocentropus** McLach.**Anisocentropus kempii**, sp. nov. (figs. 7-9).

♂, ♀. Peninsular India, Castle Rock, N. Kanara distr., x.16; S. W. Kemp (in spirit).

Head and thorax yellow. Antennae yellow, with somewhat brownish articulations; palpi maxillares 6-jointed, yellow, clothed with pale hairs; basal joint thick, oval, 3rd joint the longest, 4th and 5th ones shorter, subequal; 2nd joint a little longer than the 4th, basal joint shorter. Eyes large, in female somewhat smaller. Legs pale yellow, spurs 2.4.3. Anterior wings pale, clothed with yellowish rufous hairs, apical portion almost nude; hind portions of wings also but sparsely clothed with hairs; membrane considerably dilated in its distal half, apical margin obliquely truncated; costal margin convex. R at its end suddenly curved to  $RS_1$ , and prolonged with a feeble nervule to apical margin; discoidal cell only slightly longer than RS; MC at least  $1\frac{1}{2}$  times as long as DC, somewhat curved; fork 4 very long.



TEXT-FIG. 7.—*Anisocentropus kempii*, sp. nov., ♂; anterior wing.

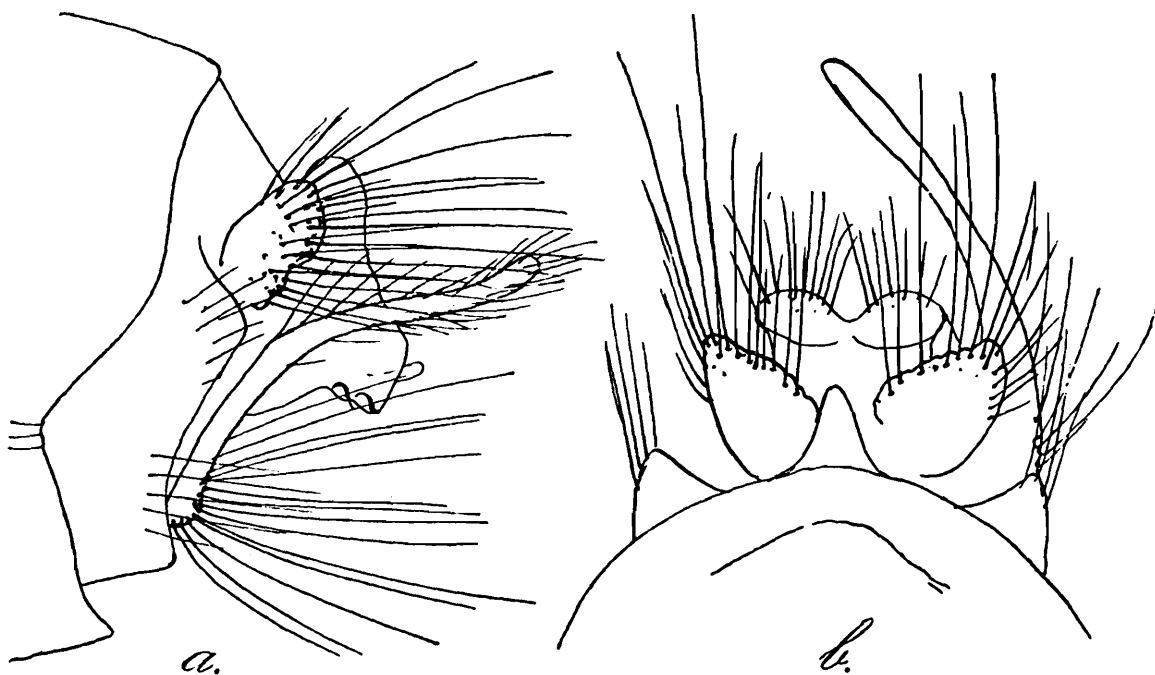


TEXT-FIG. 8.—*Anisocentropus kempii*, sp. nov., ♂; posterior wing.

Posterior wings pale, irregularly triangular, clothed with pale yellow hairs; apical margin somewhat projecting or convex at the ends of  $M_3$  and  $CuA_1$ ; SC united at its end with R, which is connected here by

a short cross vein with  $RS_1$ ; RS in its basal part connected by a short cross vein with  $M_1+2$ , then almost immediately divided into very short  $RS_1+2$  and long  $RS_3+4$ ; 2nd fork a little longer than its pedicel, but much shorter than 1st; 3rd fork beginning somewhat earlier than 2nd;  $M_3$  connected with  $CuA_1$  by an oblique vein, representing probably the basal part of  $M_4$ ;  $CuA_1$  may be considered as  $M_4$ , as in the foregoing species. CuP straight,  $A_2$  united in its proximal part with  $A_1$ ; jugal region short, narrow, but containing distinct vena arcuata (arc.). Abdomen pale yellow.

♂. Side pieces of the 9th segment not greatly projecting above the base of the pedes genitales; 9th tergite with a short tongue-shaped projection above. Preanal appendages short, broad, oval, bearing many



TEXT-FIG. 9, a, b.—*Anisocentropus kempī*, sp. nov., ♂; genital appendages from side (a) and from above (b).

long hairs. 10th segment high from side, seen from above its end portion is in the form of a transverse thickening, excised in the middle and also bearing hairs; pedes genitales long, very slender and curved; second joint not separated from the first; basal part bearing very long hairs; second joint clothed with shorter hairs. Penis invisible in our specimen.

Length of body 8 mm.

#### *Notes on wing venation in the family Calamoceratidae.*

Among the Integripalpia the family Calamoceratidae is the most archaic; the wing venation and the structure of the male genitalia reveal very primitive characters in many representatives of the family. Only in this family there is, in the anterior wings, a closed median cell (MC), usually large and bearing two forks, 3rd and 4th. Venation of the posterior wings is also very primitive; the discoidal and the median cells are here open, but it is interesting that the so-called upper branch of CuA ( $CuA_1$ ) originates in some species, for instance, in *Asotocerus flexuosus* and *Asotocerus sinuatus*, not from CuA but from  $M_3+4$ , demonstrating, morphologically, that it represents the 4th branch of M, as in



the anterior wings. Therefore M in the posterior wings in Calamoceratidae is, indeed, four-branched, and the arrangement of its branches is similar to that in the anterior wings. CuA is simple in this family or perhaps CuA<sub>1</sub> is reduced.

In *Asotocerus* and, apparently, in other genera of Calamoceratidae CuA is a strong vein, and before it there is usually a brownish chitinized streak. I am of opinion that this streak represents the remains of the vein, which is preserved before CuA in the hind wings of many species of *Setodes*. This vein is generally designated as supplemental or "false", but morphologically it represents the greatly reduced MP (mediana posterior). The vein is preserved sporadically also in some representatives of the extinct order Paratrachoptera Till., for instance, in the genus *Ferganopsyche* Mart.<sup>1</sup>, and here its significance as mediana posterior is more evident. Tillyard named this vein M<sub>5</sub> (1919), but I believe it is more convenient to name it MP, i.e. mediana posterior. We observe some remains of this vein also in some other genera of Leptoceridae and even in some few Phryganeidae and Limnophilidae. Therefore we may suggest that this vein existed formerly in the ancestors of all Integripalpia and perhaps in the ancestors of Annulipalpia, although in this suborder any remains of it are quite unknown. If this vein existed in the ancestors of Integripalpia, we may presume that it existed formerly in the ancestors of some groups of Lepidoptera, as this order (suborder Frenata) appears to me to be indubitably allied to Integripalpia and to the family Calamoceratidae, in particular.

In consideration of these facts attention may be directed to some peculiar features of the wing venation in the family Simuliidae (Diptera). It is well known that before CuA there is a thin vein, ending in a fork—"submedian fork". Some authors consider this vein as "additional" or "false", or as only a fold, but others (Vignon, Seguy, Enderlein, Edwards) take it for a true vein, belonging to M. This vein in *Simulium* appears to me to be evidently homologous with that vein in Leptoceridae, Calamoceratidae, etc., which is named MP above. Traces of this vein are apparently not completely lacking in some other families (Chironomidae). If this hypothesis is correct, this vein ("submedian fork") cannot represent M<sub>1</sub> or M<sub>2</sub>, but only MP, which existed sporadically also in the order Paratrachoptera, related to the order Diptera. Whether CuA in the posterior wings of Trichoptera was formerly simple, like Mecoptera, as was suggested by R. Tillyard, or two-branched, it is not easy to decide at present. If in *Asotocerus* the so-called CuA<sub>1</sub> probably represents M<sub>4</sub>, the arrangement of the veins in *Leptocerus distinguendus*, sp. nov. (text-fig. 13) rather supports the view of the two-branched condition of CuA, since MP is here prolonged before CuA<sub>1</sub>. Probably, in various families of Trichoptera (that is, in their ancestors) there existed formerly a somewhat diverse condition of venation. As to the forewings, it appears to me to be more probable that CuA is here truly two-branched.

The structure of the male genitalia in the family Calamoceratidae is also very primitive, but this complex problem cannot be discussed here.

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<sup>1</sup> In the press.

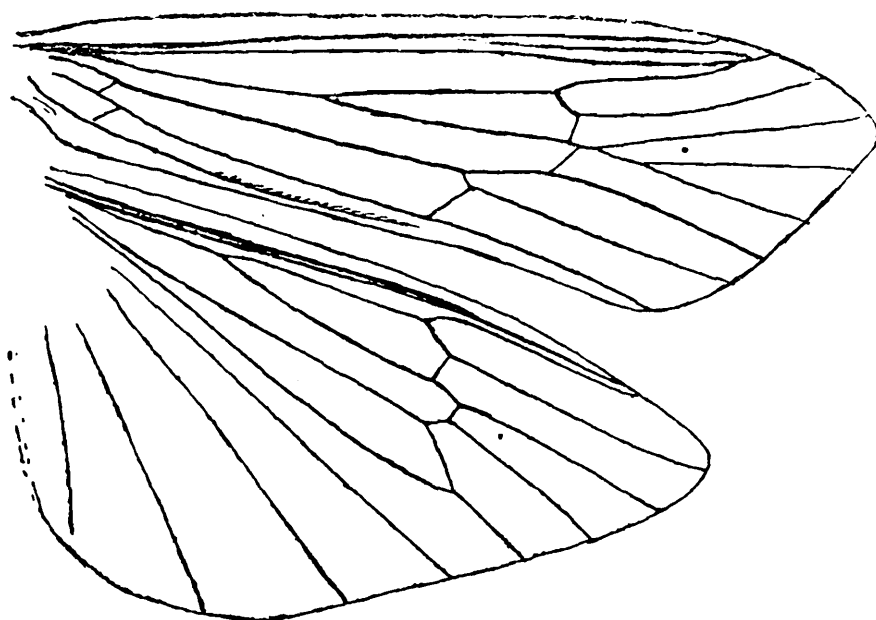
## Family ODONTOCERIDAE.

**Marilia** Fr. Müll.**Marilia ceylanica**, sp. nov.

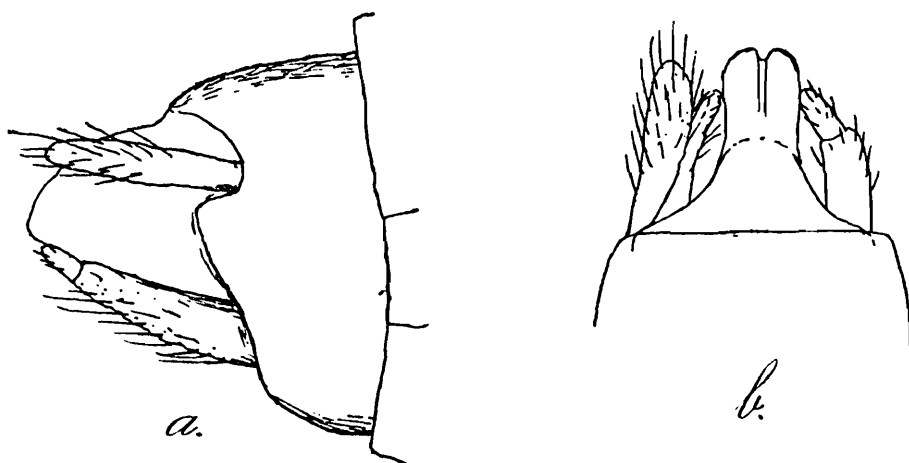
(Text-figs. 10, 11.)

♂. Ceylon, Peradeniya, 8.vi.10 (in spirit).

Head and thorax brownish; eyes large, vertex with an excision behind; basal part of antennae brownish (the remaining portion set off). Legs greyish yellowish, spurs 2.4.4. Anterior wings yellowish,

TEXT-FIG. 10.—*Marilia ceylanica*, sp. nov., ♂; venation of anterior and posterior wings.

only  $M+CuA$  is brownish; venation as in other *Marilia* species; discoidal cell of moderate length, first apical sector originating from its

TEXT-FIG. 11, a, b.—*Marilia ceylanica*, sp. nov., ♂; genital appendages from side (a) and from above (b).

apex and near its end uniting with  $R$ ;  $M_1+2$  derived from  $RS_4$ . Posterior wings pale;  $RS_1$  originating near the end of  $DC$ ;  $M_3+4$  does not

reach the edge of wing and is united with CuA, which is simple, as in males of *M. minor* Ulmer and *M. elongata* Mart. Abdomen pale.

♂. 9th segment very broad, pale yellowish, with two side excisions for the preanal appendages; 9th tergite somewhat projected, but indistinctly separated from 10th tergite. Preanal appendages digitiform from side, a little broader above, clothed with not very long hairs. 10th dorsal segment pale, very broad from side, but seen from above it is much narrower and provided at its end with a small median excision. Basal joint of pedes genitales elongated and clothed with not long but strong hairs; 2nd joint short, bearing but short setulae. Penis invisible.

*Remarks.*—Judging by the shape of DC, it is possible that *Marilia* sp. described by Betten from the Kumaon Hills (*Rec. Ind. Mus.* III, 1909, p. 239) is this species. In this species fork 4 in anterior wings of female is present, which is a feature in which it apparently differs from the known American species. However, since the species *ceylanica* sp. nov. is very similar to *Marilia flexuosa* Ulm. from N. America, I refer it to the genus *Marilia*.

#### Family MOLANNIDAE.

##### **Molanna** Curt.

##### **Molanna** sp.

♀. Bombay Presidency, hill stream on Jog-Sagar Road, N. Kanara distr., 30.xi.28; H. S. Rao.

Head and body brown; coxae brown; anterior legs brown, median legs brownish yellow, posterior legs yellow.

Anterior wings brownish, darker anteriorly, clothed with yellowish hairs; posterior wings yellowish, clothed with rufous hairs; venation in both wings much resembling that of *M. falcata* Ulm.

*Remarks.*—Although the wing venation of this species is very similar to that of *M. falcata*, I am not certain about its identity with this species. It is probable, however, that it may represent a new species.

#### Family LEPTOCERIDAE.

This family contains two unequal subfamilies, Triplectidinae and Leptocerinae. Leptocerinae is a large subfamily, rather abundantly represented in India, and in non-palaeartic Africa. It is now evident that this Indian Leptocerine fauna is closely related to the African one; it is composed mostly of the same genera and several of the species are closely allied to the African ones. The subfamily Triplectidinae is much poorer, containing but three closely related genera—*Triplectides* McLach., *Notanatolica* McLach. and *Symphitoneura* Ulm. Its representatives are not uncommon in Australia and the adjacent islands, New Zealand, the Philippines, Nippon Islands and India; and also occur in Brazil, but none are found in Africa.

## Subfamily TRIPLECTIDINAE Ulm.

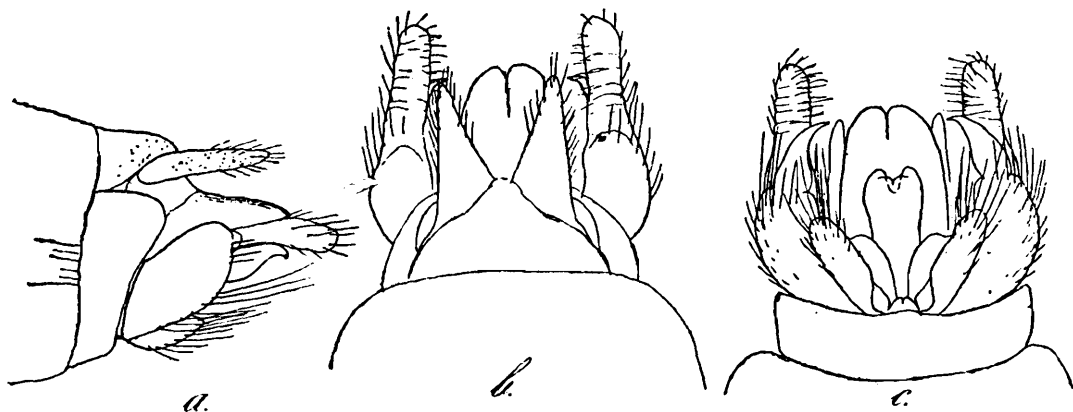
**Notanatolica**<sup>1</sup> McLach.**Notanatolica magna** Walker.(Text-fig. 12, *a-c.*)1909. *Notanatolica magna* (Walker) Betten, *Rec. Ind. Mus.* III, p. 239.

- 3 ♂, 2 ♀. Chota Nagpur, Chakradharpur, Singhbhum distr., 8-10.ii.18, at light; N. Annandale and F. H. Gravely (in spirit).  
 ♀, ♀. Calcutta, 28.ii.11 and 11.iii.15, at light; F. H. Gravely.  
 ♀. Calcutta, 17.ii.26; R. B. S. Sewell.  
 ♀. Bihar, Katihar, Purneah distr., 1-24.x.10; C. Paiva.  
 4 ♂. Bihar, Forbesganj, Purneah distr., 10.ix.10; C. Paiva.  
 2 ♂. Orissa, Balighai, near Puri, 16-20.viii.11; N. Annandale & F. H. Gravely.

I refer all these specimens to *N. magna* Walker, although they differ somewhat from each other in size, colour and even in some details of wing venation. However, this widely distributed species is variable enough, and the difference between our specimens does not, apparently, exceed the limits of the variability of this species. Considering the size of the specimens I distinguish among them two forms, a larger and a smaller. To the large form belong three females from Calcutta and one from Katihar, and the males and females from Chakradharpur. The length of the bodies in this form is 8-13 mm., the males are smaller than the females. To the second form belong specimens from Forbesganj and from Balighai,—all males, with the length of the body 6.5-7.5 mm. Colouring similar, but the smaller form appears to be a little paler. Antennae brownish yellow, with blackish annulations, clothed with white hairs; spurs 2.2.2. Anterior wings variable, being clothed with pale and brownish hairs; posterior wings clothed with rufous yellowish hairs. Venation of anterior wings similar to that in *N. magna* and to Betten's figure 5, pl. xvii, but somewhat variable. 1st fork a little variable in its length; 4th apical cell sometimes has a short pedicel; vein, closing DC, is sometimes rightly transverse, sometimes concave outwards. In the posterior wings in two females from Calcutta and in the specimen from Katihar fork 1 is present, but in the third female (17.ii.26) from Calcutta it is lacking, although all these specimens are quite similar in other features. In the specimens from Chakradharpur (3 ♂, 2 ♀) only one male and one female have the 1st fork in their hind wings, whereas three specimens are without this fork. In the collection from Forbesganj (4 ♂) one specimen is without the 1st fork, but  $RS_1$  is a little bent at the point, while in other specimens it starts from  $RS_2$ . Two specimens from Balighai possess the 1st fork, but in one specimen there is an irregular 3rd fork. 1st fork of posterior wings, when present, is never very short. Taking into consideration the condition in the above mentioned male from Forbesganj and in one specimen from Calcutta I come to the conclusion that this fork 1 is very inconstant in the Indian form of *N. magna*; it may be present or absent. In the specimen from Forbesganj

<sup>1</sup> Dr. M. Mosely (*Trans. Ent. Soc. London*, LXXXV, p. 3, 1936) has now united the genus *Notanatolica* with the genus *Triplectides* Kol., but as my paper was already in press I could not make the necessary changes without considerable alterations.

it is  $RS_2$ , which vanishes; in the specimen from Calcutta (28.ii.11; Gravely), on the contrary,  $RS_1$  is reduced, shortened and very weak, scarcely appreciable. Since the venation of the wings in our specimens is quite similar to that of *N. opposita* (?) Betten, except the condition in fork 1 of the posterior wings, I come to the conclusion that Betten's *N. opposita* is perhaps *N. magna*; among specimens from near Calcutta occur forms with and without 1st fork in the posterior wings. I give three figures of the male genitalia prepared from a specimen collected at Chakradharpur.



TEXT-FIG. 12, a-c.—*Notanatolica magna* Walk., ♂; genital appendages from side (a), from above (b) and from beneath (c).

#### Subfamily LEPTOCERINAE.

#### **Leptocerus** Leach

#### **Leptocerus distinguendus**, sp. nov.

(Text-figs. 13, 14.)

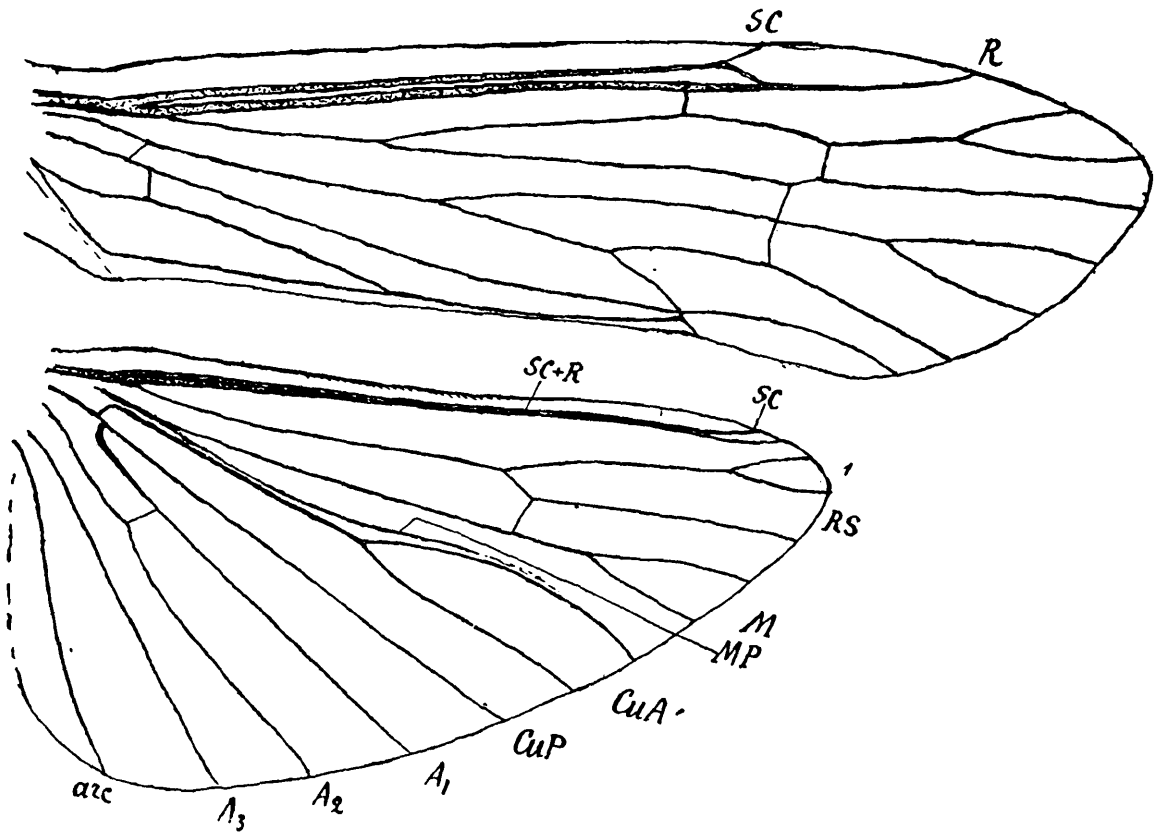
♂. Rewa State, opposite the camp at Harra, 2,625 ft., iii.27; H. S. Pruthi (in spirit).

Head yellow with yellow antennae (incomplete). Meso- and meta-thorax brownish above, paler at sides; legs yellowish, spurs 2.2.2. Membrane of the anterior wings (in spirit!) pale; R and SC strong; discoidal cell very long; fork 1 only a little longer than its pedicel, fork of M longer than its pedicel. In posterior wings fork 1 short, fork of M somewhat longer than its pedicel; cubital fork long; before CuA there is a rudiment of MP, well seen at the end of CuA and at the basal portion of CuA<sub>1</sub>. Abdomen pale.

♂. Structure of ♂ genitalia similar to that of *L. annulicornis*, *L. aterrimus* and allied species. 9th segment forms two side projections above the base of pedes genitales; 9th tergite forms a short dorsal plate, narrowed and truncated at its end; preanal appendages broad, triangular from side, but not long; these processes are united together in the middle.

Pedes genitales at first ascending, then curved backwards; inner branches stick-shaped, slender, but somewhat shorter than the distal parts of the pedes genitales; basal portions thickened and pale, if seen from beneath. 10th segment forming a broad plate (above), sides of

which are curved downwards and form two ridges at their ends separated by two short excisions from the middle portion ; this is also provided



TEXT-FIG. 13.—*Leptocerus distinguendus*, sp. nov., ♂ ; venation of wings ; MP—remains of “ false ” vein (mediana posterior).

with a small median excision. Penis short, curved downwards. Length of body 7.2 mm.



TEXT-FIG. 14, a-c.—*Leptocerus distinguendus*, sp. nov., ♂ ; genital appendages from side (a), from beneath (b) and from above (c).

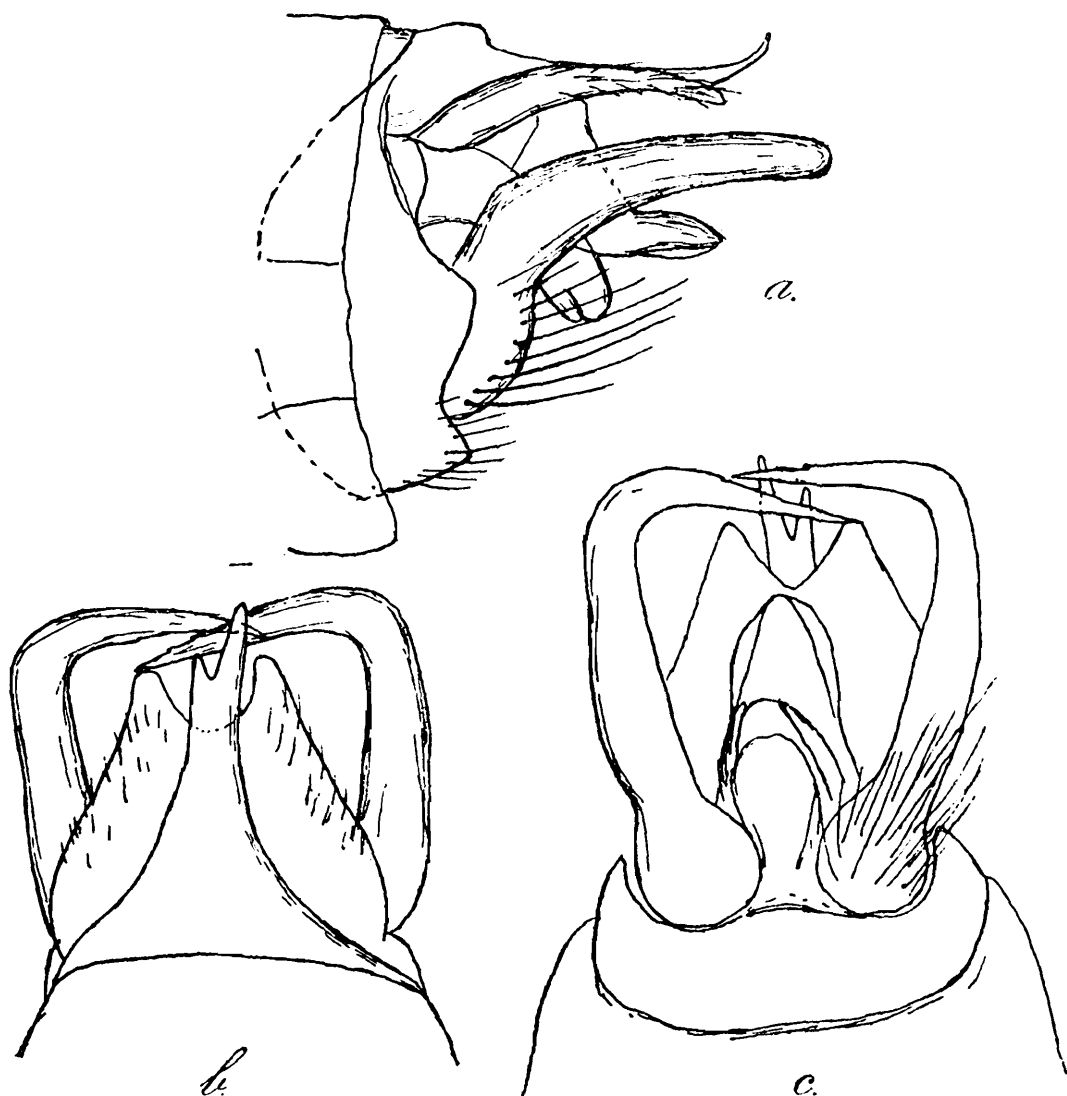
*Remarks.*—This species appears to be allied to *L. annulicornis* and related species. From a morphological point of view it is interesting in the presence of a distinct rudiment of what I consider to be MP<sup>1</sup>, before CuA.

<sup>1</sup> As stated already rudiments of this vein are preserved in some fossil Paratrichoptera and among recent Trichoptera, especially in *Setodes*.

***Leptocerus forcipatus*, sp. nov.**(Text-fig. 15, *a-c.*)

♂. Rewa State, opposite the camp at Harra, 2,625 ft., iii.27; H. S. Pruthi (in spirit).

Head brownish above; antennae brownish yellow, narrowly annulated with black; palpi pale. Thorax brownish, legs yellow. Membrane of anterior wings pale (in spirit!) with dusky pterostigma; R thick; fork 1 twice longer than its pedicel, discoidal cell at least  $\frac{1}{3}$  longer than thyridial cell; anastomosis gradate. In posterior wings fork 1 somewhat shorter than its pedicel. Abdomen pale, 9th segment yellow.



TEXT-FIG. 15, *a-c.*—*Leptocerus forcipatus*, sp. nov., ♂; genital appendages from side (*a*), from beneath (*b*) and from above (*c*).

♂. 9th segment with two moderate projections above the bases of the pedes genitales, narrowing above; median portion of the 9th tergite extended into a narrow, pale, weak plate, which is more or less united above with the dorsal plate. The latter is formed by two coalesced preanal appendages and represents a broad yellowish plate, narrowed behind, with the median rounded triangular excision at its end. Median process of the 9th tergite is somewhat longer than this plate, and its end portion is divided into two unequal lobes or processes

by a narrow excision. 10th segment in its basal part directed rather downwards, then extended backwards into a moderate projection, side portions of which are as usual curved downwards; penis is situated under the 10th tergite but, almost invisible in this specimen.

Pedes genitales yellow or dark yellow; their basal portions very short, ascending, then suddenly turned backwards and produced into two long processes; distal portions of the latter are curved inwards, crossing each other and acute at ends; apical portions somewhat serrate.

Length of ♂ body 6 mm.

*Remarks.*—The structure of the male genital appendages in this species is peculiar.

### **Leptocerus** sp.

♀. Rewa State, opposite the camp at Harra, iii.27; H. S. Pruthi (in spirit).

It is impossible to determine the species from the single female specimen.

### **Parasetodes** McLach.

#### **Parasetodes bakeri** Bks.

1913. *Leptocella bakeri*, Banks, *Proc. Ent. Soc. Washington*, XV, p. 177, pl. ix, fig. 15.

1915. *Leptocella bakeri*, Ulmer, *Deutsch. Ent. Zeitsch.* p. 56, figs. 28, 29 (Ceylon).

9 ♂♂. West Bengal, on board steamer in the River Ganges between Sakri Gali and Manihari Ghat, 7.viii.10, at light; C. Paiva (in spirit).

4 ♂♂. Upper Burma, Yenangyaung, Magwe, 300 ft., viii-ix.11; J. C. Brown.

♂. Bihar, Pusa. 26-30.viii.25; H. S. Pruthi.

♂. Bihar, Siripur, Saran. 25.ix.10; Mus. Collector (dry specimen).

*Parasetodes (Leptocella) bakeri* was described by Banks from the Philippine Islands and was referred by him to the genus *Leptocella* Bks. It was described under the same name by Ulmer from Ceylon. Since in the wing venation and in the structure of the male genitalia this species is very similar to *P. respersella* McL. and to other species of the genus *Parasetodes* McL., I refer it to this genus. Dorsal plate (10th segment) is well seen from side (in Ulmer's drawing it is not figured, probably by accident).

The colouration of the forewings is somewhat variable.

### **Setodes** Ramb.

#### **Setodes inlensis**, sp. nov.

(Text-figs. 16-18.)

Many specimens. S. Shan States, Inlé Lake, Yawnghwe State, 3,000 ft., 1.iii.17; F. H. Gravely (in spirit).

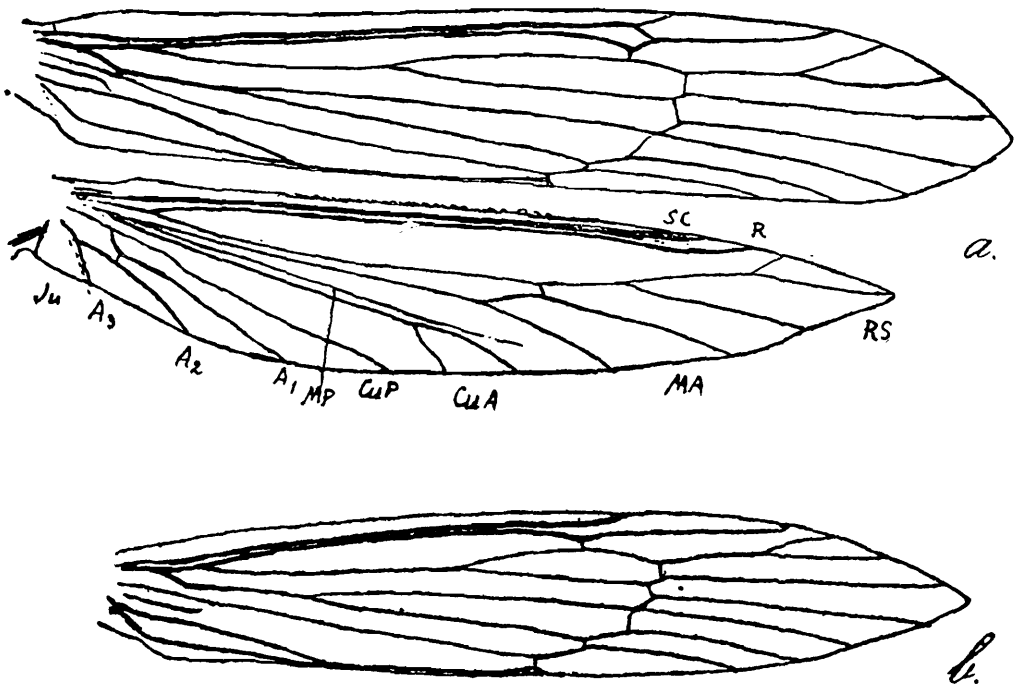
♂, 2 ♀. The same locality. 18-28.ii.17; F. H. Gravely (dry specimens).

♀. Orissa, Balighai, near Puri. 16-20.viii. 11; N. Annandale and F. H. Gravely.

Head and thorax yellowish testaceous above, sides yellowish, abdomen pale. Joints of antennae brownish, but the basal portion of each



joint pale; palpi and legs pale, spurs 0.2.2. In dry specimens the head and thorax are rather brown, median portion of mesonotum being covered with pale hairs. Anterior wings narrow, subacute, clothed with yellowish hairs (somewhat thickened), mixed with brownish, in the apical portions in particular; apical parts provided with a few whitish spots or dots; along R brownish hairs interrupted by several whitish dots, and similar white spots are situated along CuA, separat-



TEXT-FIG. 16, a, b.—*Setodes intensis*, sp. nov., (a) venation of wings in ♂; (b) venation of anterior wing in ♀.

ing brown spots; fringe brownish yellowish. SC strong, R appears connected by short cross-vein r-rs to  $RS_{1+2}$ ; discoidal cell long in males, connected with R by cross-vein r-rs, near its end; in the female it is much shorter, cross-vein r-rs reaching  $RS_{1+2}$  near the middle of the discoidal cell; 1st apical fork a little shorter than its pedicel; base of M bent towards R. Posterior wings narrow, acute, pale, covered with rufous hairs; fringe long, rufous; SC strong, R running near it; cross-vein rs-m situated near the base of  $M_{1+2}$ ; additional vein before CuA distinct, long, cubital fork rather short; CuP and analia, as usual.

♂. Side pieces of 9th segment triangular, dorsal part pale, indistinctly separated from the dorsal plate (=10th tergite); this plate is broad above, elongated, with a shallow excision at end; before the end it is provided with 3-4 bristles at each side; its outer angles prolonged into two short slender processes. Seen from the side the dorsal plate is broad at base, then narrows and ends in the two just named slender processes. Pedes genitales large, divided into two portions, lower and upper; lower branch broad from side, with its end curved upwards and inwards; upper branch digitiform, but thick, bearing prominent hairs. Seen from beneath pedes genitales (lower branches) are elongated, tapering gradually; end portions curved inwards, triangular, acute at ends. Penis short, but much thickened in its apical portion, divided here into two projections, upper and lower; the lower curved downwards,

the upper plate-like, with a median fissure subdivided into two elongated side portions.



TEXT-FIG. 17, a-c.—*Setodes inlensis*, sp. nov., ♂; genital appendages from side (a), from above (b) and from beneath (c).

♀. Dorsal plate broad above, with a shallow median excision at end; seen from the side it is obliquely truncated at end; lateral lobes of 9th segment very long and broad from side, narrow and truncated at ends if seen from beneath; between them 9th sternite provided with a triangular projection.

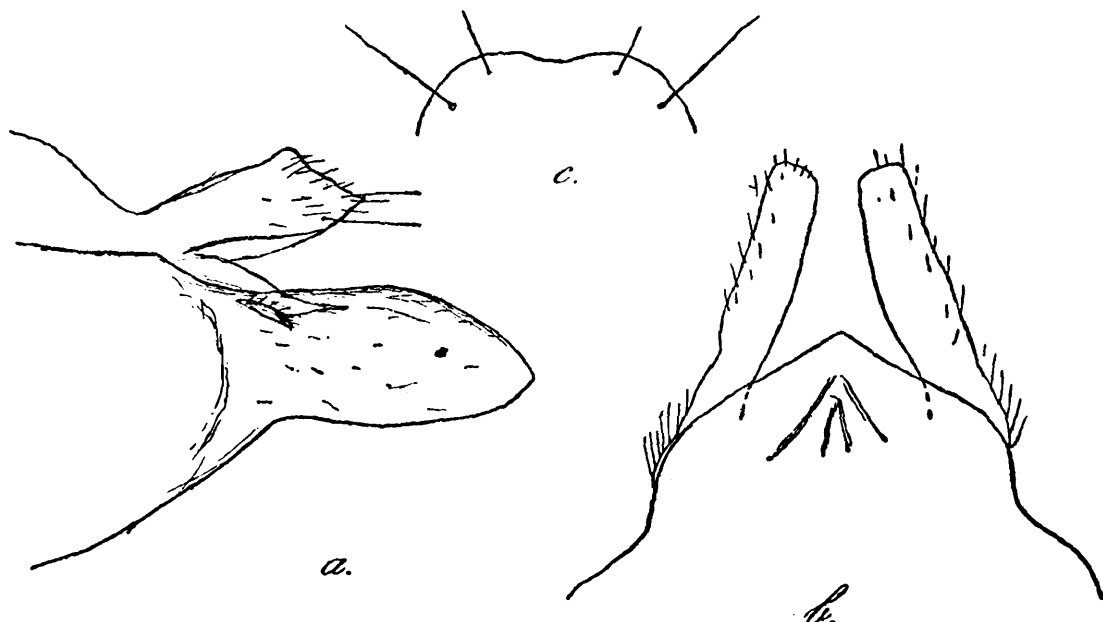
Length of body 4.5 mm.

Var. ? ♀. Sind, Bubak, from pools 13.xi.27; B. Prashad & B. N. Chopra.

Anterior wings clothed with yellow and pale scale-like hairs between M and Cu; whitish dots present, although not as distinct. Posterior wings rufous. Length of body 6 mm.

*Remarks.*—*Setodes inlensis*, sp. nov. is a distinct species differing in the structure of the ♂ genitalia, as also in wing-venation. The so-called false or additional nervure before CuA in the hind wings is here

distinct enough and at its base is connected with M. This vein is evidently homologous with that vein in some fossil Paratrachoptera



TEXT-FIG. 18, *a-c.*—*Setodes inlensis*, sp. nov., ♀; genital appendages from side (*a*) and from beneath (*b*); (*c*) end of 10th segment from above.

described in another paper, which I take for MP (median posterior). It is subject to reduction in Paratrachoptera and Trichoptera, but rudiments of it are preserved in several genera of Trichoptera.

***Setodes unispina*, sp. nov.**

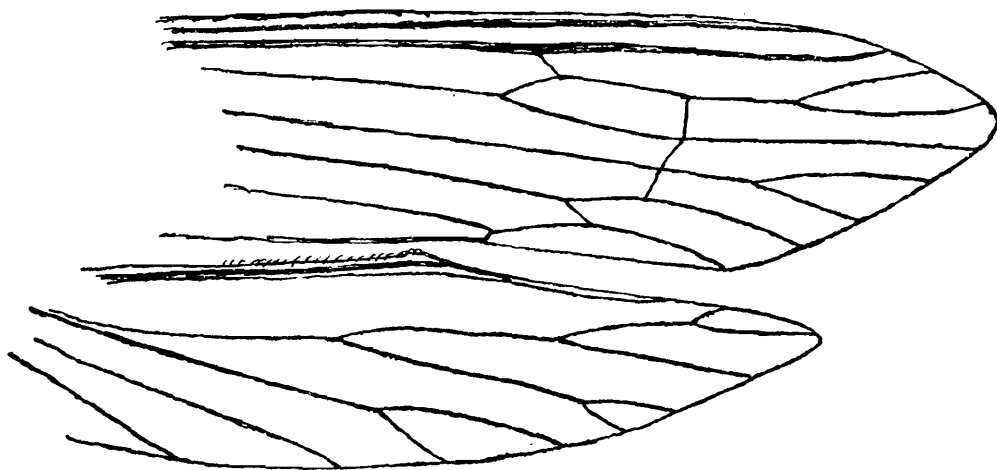
(Text-figs. 19-21.)

♂. Chota Nagpur, Purulia, Manbhum distr., 10.ii.12; F. H. Gravely.

♂. Chota Nagpur, Chakradharpur, Singhbhum distr., 8-10.ii.18; N. Annandale & F. H. Gravely.

Several specimens. Chota Nagpur, Sanjai River, Chakradharpur, 8-10.ii.18; N. Annandale and F. H. Gravely (in spirit).

Head and thorax yellow, antennae pale yellow, legs and abdomen pale. Wings pale, translucent (in spirit). In the anterior wings the

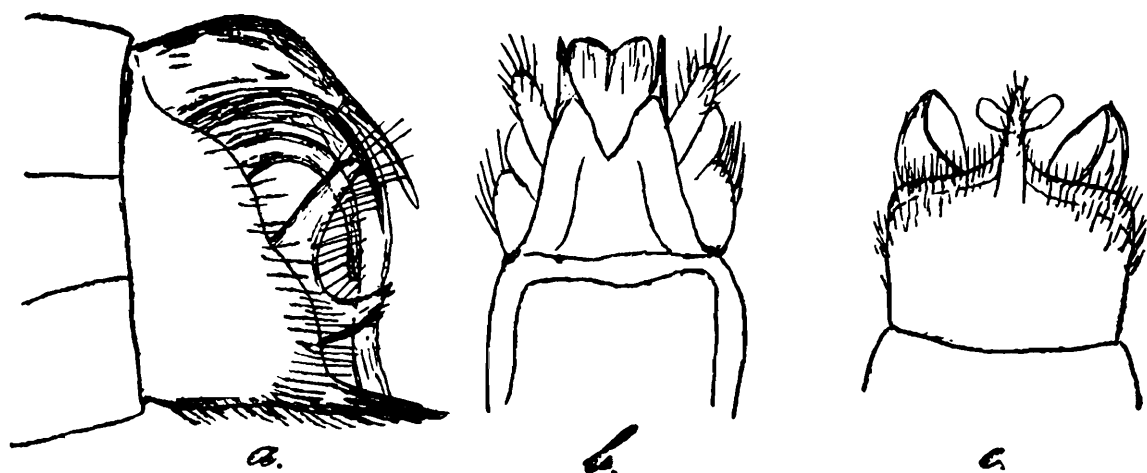


TEXT-FIG. 19.—*Setodes unispina*, sp. nov., ♂; wing venation.

discoidal cell is short, near its base it is connected by a cross-vein with R, which is thick; cross-veins of the anastomosis forming a fractured

line. In the posterior wings fork 1 distinct, not very short; fork 3 very short, fork 5 longer; additional vein before Cu (MP) lacking.

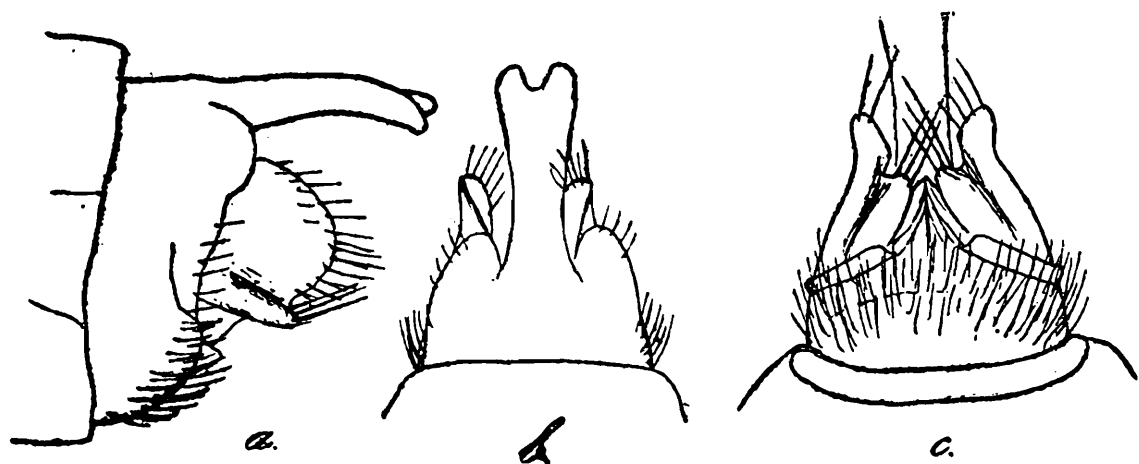
♂. 9th segment much dilated at sides and underneath; narrow, indistinct above; 9th sternite very broad and provided with a median spine-like process. Dorsal plate (10th segment?) rather large, pale; seen from above it is broad, somewhat narrowed behind and triangularly excised at end; its end-lobes are prolonged into two slender processes, directed downwards and backwards. Seen from the side the dorsal plate is thick and convex above, bearing the two above named slender processes. Under these are seen two more slender processes near the penis; the latter is very long and turned downwards. Pedes genitales



TEXT-FIG. 20, a-c.—*Setodes unispina*, sp. nov., ♂; genital appendages from side (a), from above (b) and from beneath (c).

are seen only in their distal parts, basal parts being concealed by the side pieces of 9th segment; seen from the side they are very broad at base, but almost immediately divided into two branches; upper branch digitiform and directed somewhat upwards; lower branch shorter, subacute at end and separated from the first by a broad, rounded excision. Seen from beneath (text-fig. 20c) the lower branches are broad, concave internally. Penis very long, directed downwards.

Length of body 4.8 mm.



TEXT-FIG. 21, a-c.—*Setodes unispina*, sp. nov., ♀; genital segments with appendages from side (a), from above (b) and from beneath (c).

♀. 9th segment broad from side, dilated upwards, but narrowing above and uniting here with a long plate-like process, which belongs

probably to the 10th segment; this plate is pale, its apex divided into two lobes by a short median excision. Lateral appendages of 9th segment broad, rounded at ends and hairy; their lower parts are somewhat bent inwards and bear few long bristles. Between these appendages is situated a triangular projection of the 9th sternite seen from beneath.

*Remarks.*—*Setodes unispina* sp. nov. resembles *Setodes argentoaurea* Ulm. from the Celebes in the structure of the male genitalia.

***Setodes argentifera* McLach.**

(Text-fig. 22.)

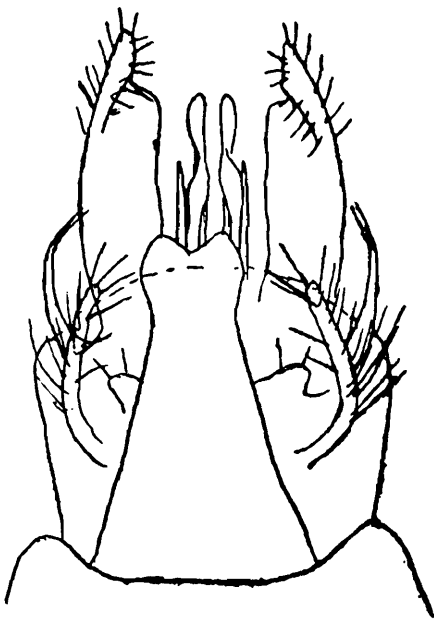
1873. *Setodes argentifera*, McLachlan, *Journ. Linn. Soc. London (Zoology)*, XI, p. 129, pl. iii, fig. 13.

1909. *Setodes argentifera*, Betten, *Rec. Ind. Mus.* III, p. 240, pl. xvii, figs. 9-11.

4 ♂♂. Bihar, Mokameh Ghat, at light (in spirit).

2 ♂. Bihar, Pusa, 5-10.ii.15; F. H. Gravely.

This species was described from North India without any precise locality. Betten gave two figures of the male genitalia; I add here a figure of the end of the ♂ abdomen as seen from above. Dorsal plate



TEXT-FIG. 22.—*Setodes argentifera* McLach., ♂; genital appendages from above.

(10th segment) long, narrowing backwards, with a bilobed apical portion. Below from it are seen two pairs of spine-like appendages, and the penis, which is bilobed. Pedes genitales, seen from the side, moderately broad, but their apical portion is slender. With the base of pedes genitales are connected two long slender appendages curved upwards, then backwards and inwards.

***Setodes tenuifalcata*, sp. nov.**

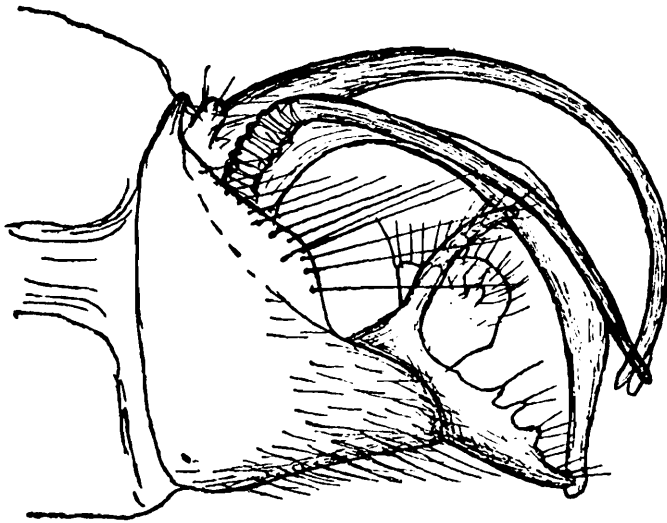
(Text-figs. 23, 24.)

2 ♂. Chota Nagpur, Sanjai River, Chakradharpur, 8-10.ii.18; N. Annandale and F. H. Gravely (in spirit).

Head and the whole body pale yellowish; antennae pale yellowish, palpi and legs pale. Anterior wings (membrane) pale yellowish, narrow;

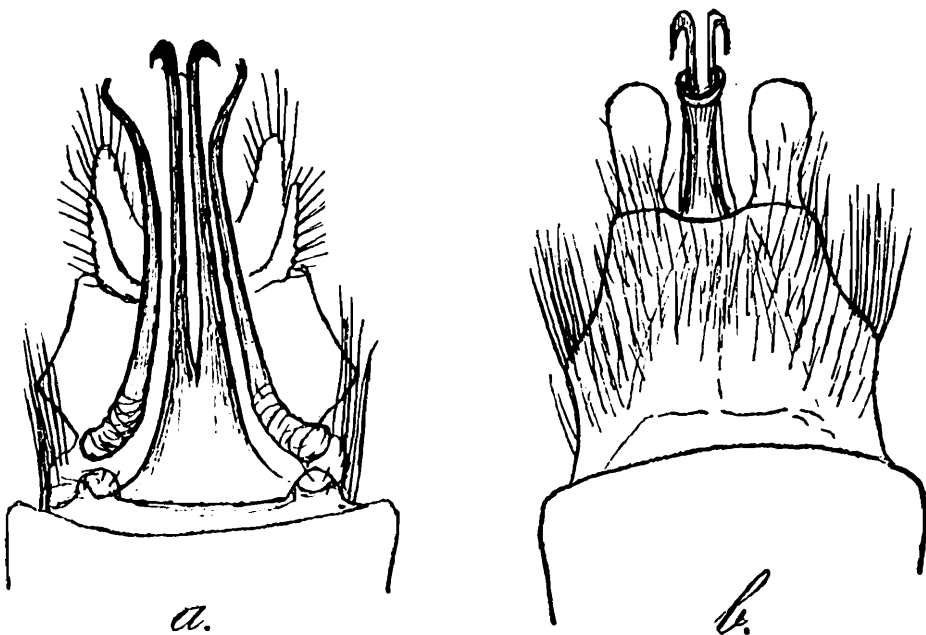
DC moderately long, 1st apical fork longer than its pedicel and nearly equal to the fork of mediana; second and third cross-veins of anastomosis oblique and placed almost in one line, cross-vein closing discoidal cell placed somewhat further. Posterior wings a little broader than the anterior; fork 1 small, narrow, main fork of RS equal to fork 5; fork of mediana shorter; RS short and lacking in its greatest proximal part.

♂. Structure of ♂ genital appendages similar to that in *S. uncinata* Ulm., *S. falcata* Ulm. and allied species. 9th segment strongly dilated in its ventral portion, very narrow in its dorsal part; side pieces forming two low plate-like projections, bearing long hairs. 10th seg-



TEXT-FIG. 23.—*Setodes tenuifalcata*, sp. nov., ♂; genital segments and appendages from side.

ment in its basal portion entire, broad, but narrowed behind and soon dividing into two long, slender, falciform processes, with their ends



TEXT-FIG. 24, a, b.—*Setodes tenuifalcata*, sp. nov., ♂; genital appendages from above (a) and from beneath (b).

curved downwards. Pedes genitales already in their basal portions divided into two branches, the lower branch is directed backwards and

downwards, and the upper upwards; lower branches, if seen from beneath, not long but broad, with rounded apices; seen from the side they are also broad, above with 3 or 4 minute processes, bearing few bristles; upper branch directed nearly upwards, stick-shaped, a little curved, hairy; internally from the bases of the pedes genitales arise two broad plates, apparently united together; their upper edge irregular, rounded, with short outstanding bristles. Penis very long, arcuate, curved downwards; it is accompanied at the sides by two long slender titillators, subdivided at their ends into two minute portions; they are somewhat shorter than the penis; their basal portions are very pale, irregularly annulated and apparently, flexible; their bases are united with the basal part of the penis.

Length of body 5 mm.

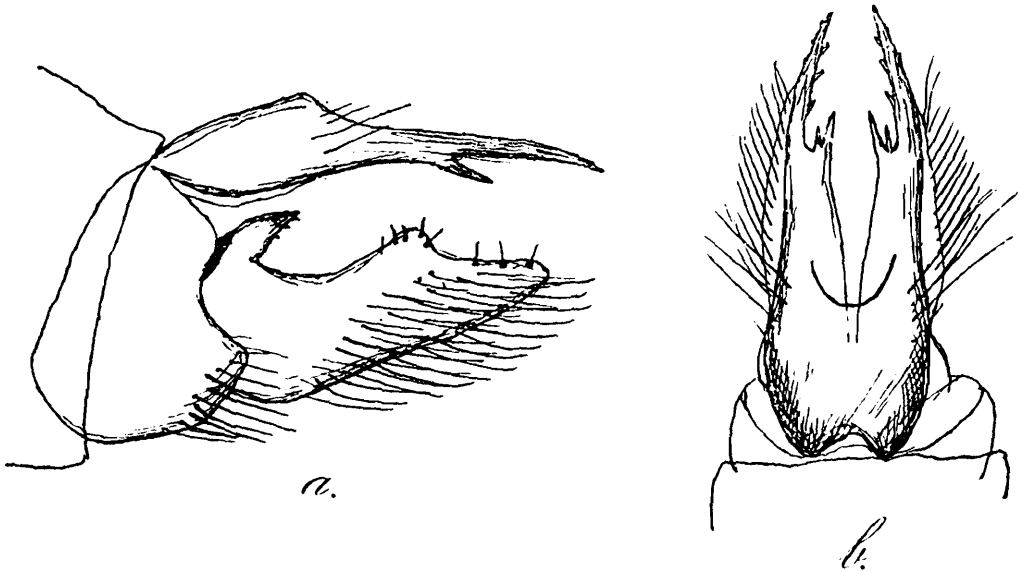
*Remarks.*—This species belongs to the group of *viridis* and is apparently more allied to *S. uncinata* Ulm. from Java and *S. falcata* Ulm. from the Philippine Islands.

***Setodes bimaculata*, sp. nov.**

(Text-fig. 25, *a-b*.)

♂. Bihar, Katihar, Purneah distr., 7-31.viii.10; C. Paiva.

Head and thorax brown, clothed with brown hairs, becoming blackish between the antennae. Joints of antennae brownish yellowish, but the basal portion of each joint white; basal joint brown, clothed with whitish hairs; palpi pale, legs pale. Anterior wings narrow, brownish,



TEXT-FIG. 25 *a, b.*—*Setodes bimaculata*, sp. nov., ♂; genital appendages from side (*a*) and from beneath (*b*).

densely clothed with brown hairs; in the hind portion of wings the hairs are yellow and whitish, with brown interruptions; there are two distinct white spots, one spot in the base of the 2nd and the second at the base of the 3rd vein of the wing; behind these white spots are two greyish hyaline markings; in the apical portion there are three or four

small white spots; apical fringe white; discoidal cell short, 1st apical fork equal to its pedicel, 3rd fork almost equal to it. Posterior wings greyish, provided with long rufous-greyish fringe, narrow; 1st apical fork shorter than its pedicel; M forming short narrow fork; 5th apical fork longer. Abdomen brownish.

♂. Structure of male genitalia resembling that of *Setodes tineiformis* Curt. and of *Setodes similis* McLach. 9th segment broad at sides, with triangular projections at the base of pedes genitales. 10th segment in its basal part entire, moderately broad, then dividing into two long and more slender portions, each of which is provided internally with an acute tooth in the middle; distal portions slender and provided internally with four small denticles (proximal denticle is situated at the base of the inner, larger tooth). Pedes genitales large from side, narrower beneath, straight. Seen from the side they each form a small triangular process at base; then their upper and lower edges become parallel at some distance; end portion subtriangular as in many *Rhyacophila* species, with upper margin concave, separating a low oval basal portion from the elongated distal lobe; both lobes provided above with several spinules. Penis not exerted.

*Remarks.*—In the structure of the male genitalia this species somewhat reminds one of *S. tineiformis* Curt. and *S. similis* McLach. Pedes genitales resemble those in *S. similis*, but the basal process is here much longer. In the wing venation *S. bimaculata* sp. nov. greatly resembles *S. bifasciipennis* Ulm. from the Philippines.

### **Setodes sternalis**, sp. nov.

(Text-fig. 26, a-b.)

♂, ♀. Rewa State, opposite the camp at Harra, iii.27; H. S. Pruthi.

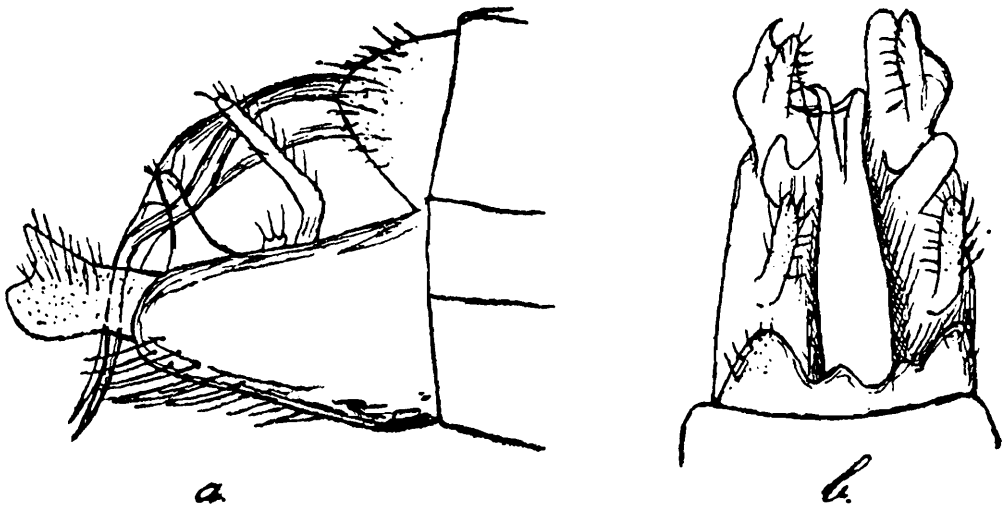
Head pale, with yellowish antennae; thorax yellowish, legs yellow; anterior wings pale; DC short, cross-vein r-rs reaching it near its base; apical fork 1 longer than its pedicel, median fork with a pedicel; cross-veins rs-m and m-cu placed near each other, cross-vein closing the discoidal cell situated far beyond them.

In the posterior wings main fork of RS only a little longer than the forks of mediana and of CuA (fork 5), which are nearly equal; 1st apical fork very small. Abdomen pale.

♂. 9th segment large, broad, subdivided into dorsal and ventral parts by two triangular lateral excisions; dorsal part is triangular from side and morphologically represents preanal appendages, coalesced with the true dorsal part of the segment. Ventral half of 9th segment very large, produced far backwards; seen from above the 9th tergite is subdivided by three excisions into four lobes. Pedes genitales short, pale; seen from the side, they are excised at the ends, with the upper lobe narrow and the lower broad; seen from above, they are convex externally and somewhat asymmetrical, the right appendage being excised at the end and thus forming a short claw-shaped slender process on its outer angle. Internally and more basad with the basal portions of pedes genitales are connected two more appendages directed upwards; the basal one is stick-shaped and curved somewhat backwards, the distal



one plate-like, pale, shorter, but broader than the first; between them is a small projection with three bristles.



TEXT-FIG. 26, a, b.—*Setodes sternalis*, sp. nov., ♂; genital segments and appendages from side (a) and from above (b).

10th segment in the shape of a narrow, but very long plate, the median portion of which is thin, whereas side portions are thickened forming two long appendages curved downwards; the left thickening is somewhat higher than the right, which is sinuous; end portion of the left thickening curved to the right; penis concealed under the 10th segment.

Length of ♂ body 5.4 mm.; female 4 mm.

*Remarks.*—This species is evidently rather closely allied to *Setodes amurensis* Mart. from Amur, resembling it in the structure of the ♂ genitalia in particular, in the structure of the 9th segment with its preanal appendages, and of the pedes genitales.

### **Trichosetodes** Ulmer.

#### **Trichosetodes composita**, sp. nov.

(Text-figs. 27, 28.)

5 ♂♂. Chota Nagpur, Sanjai River, Chakradharpur, 8-10.ii.18; N. Annandale and F. H. Gravely (in spirit).

Head pale; basal joint of antennae thick, longer than the head, at its end bearing a tuft of long thin hairs; thread of antennae slender, pale, with brownish annulations; joints rather long. Thorax pale yellow, legs yellow, spurs 0.2.2. Anterior wings pale (in spirit!), narrow, acute at their ends; costal (marginal) vein thick, bearing series of numerous (about 90) minute internal dot-like thickenings; R and SC strong, uniting together before the middle of the discoidal cell; this cell is long, somewhat longer than its pedicel, near its base connected with R and near its middle by a cross-vein with M; fork 1 a little longer than its pedicel; M and CuA uniting before the middle of RS. Posterior wings shorter, acute at ends; region of costal hooks short; SC + R strong; RS without

basal continuation; fork of M short, as short as fork 1; fork 5 a little larger; before CuA feeble remains of MP.



TEXT-FIG. 27.—*Trichosetodes composita*, sp. nov., ♂; venation of anterior and posterior wings.

Abdomen pale, 9th segment yellow, pedes genitales and 10th segment brownish.

♂. 9th segment very broad, in particular in its lower portion; dorsally there is a short subtriangular yellowish dorsal plate, apparently belonging



TEXT-FIG. 28, a-c.—*Trichosetodes composita*, sp. nov., ♂; genital segments and appendages from side (a), from beneath (b) and from above (c).

to the 9th dorsal segment. Preanal appendages short, pale. 10th segment appears to be narrow at its base when seen from above, then it

dilates into a subquadrangular plate above, with processes at its hind angles; on the left angle it has two short processes, on the right side one long process, curved abruptly inwards, then downwards and backwards (from side). Pedes genitales in the form of two long unequal processes; the left process shorter than the right, in its distal half curved somewhat inwards and acute at end; the right process longer and thicker, arcuately curved inwards, basal portions of these processes bearing tufts of long thin hairs; similar hairs are present also on the distal parts of processes. With the 9th sternite are connected two more processes; they are much shorter than the processes described above, pale, bearing dense hairs on their hind edge; these processes also probably belong to the pedes genitales. Penis thick, curved downwards; with asymmetrically formed apex. With the base of the penis are connected (apparently) two stick-shaped processes, directed backwards and somewhat upwards and acute at their ends; seen from the side they are situated above the pedes genitales, but are more than twice as short as these appendages.

Length of body 3.7 mm.

*Remarks.*—This species is quite distinct from *Tr. argentolineatus* Ulmer described from Ceylon in the structure of the ♂ genitalia as well as in its wing venation.

### **Episetodes**, gen. nov.

Spurs 0.2.2; palpi long, as in *Setodes* Ramb. Anterior wings narrow, acute; venation as in *Setodes*, but CuP is lacking and the cross vein between M and CuA is also absent. Posterior wings also narrow and acute at ends; fork of M very short, CuA simple, without fork; feeble remains of MP may be seen before CuA.

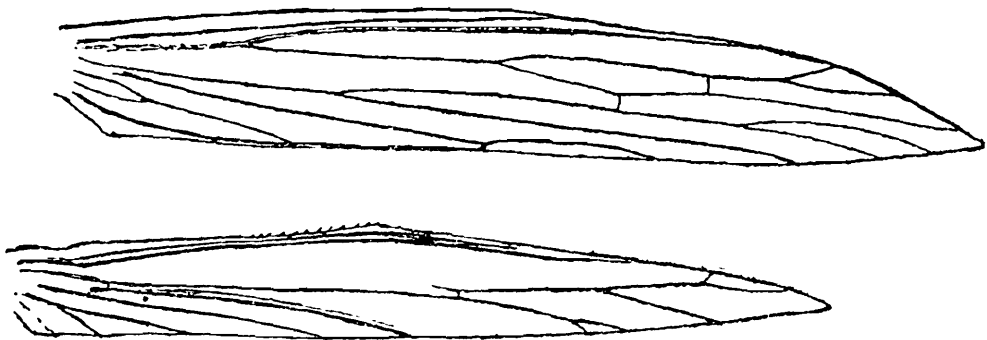
*Genotype.*—*Episetodes angustipennis*, sp. nov. from Rewa State, Central India.

### **Episetodes angustipennis**, sp. nov.

(Text-figs. 29, 30.)

♀. Rewa State, junction of two streams about a mile below Pharisemar, 18.ii.27; S. L. Hora (in spirit).

Head and thorax brownish yellowish; basal joint thick and somewhat longer than the head, 2nd joint very short (the remaining part is



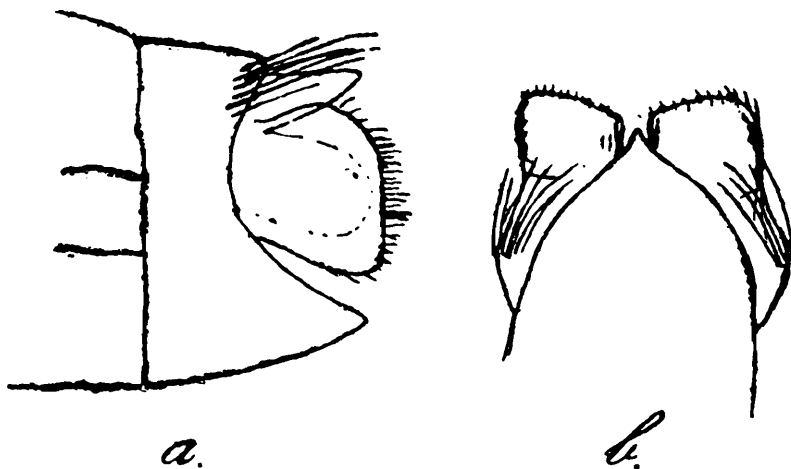
TEXT-FIG. 29.—*Episetodes angustipennis*, gen. et sp. nov., ♀; wing venation.

set off). Legs pale yellow, spurs 0.2.2. Anterior wings yellowish, long, narrow, acute at their ends; R rather strong, but vanishing in its basal

part ; discoidal cell moderately long, at its middle connected by a cross-vein with M ; cross-vein m-cu invisible or lacking, CuP also absent.

Posterior wings very narrow, acute ; RS connected with a cross-vein with M ; its basal part lacking ; fork of M very short, CuA simple ; remains of MP before CuA present. Abdomen brownish yellowish.

♀. 9th segment dilated below and forming beneath a small median process ; side lobes of the 9th segment very broad, dilated backwards and truncated at their ends ; on the hind edge is situated a series of short



TEXT-FIG. 30, a, b.—*Episetodes angustipennis*, gen. et sp. nov., ♀ ; genital segments and appendages from side (a) and from beneath (b).

hairs ; seen from beneath the side lobes are approximated and nearly touch each other. 9th tergite with two groups of bristles ; dorsal plate weakly rounded at end. Male unknown.

*Remarks.*—The genus *Episetodes* is, perhaps, allied to *Trichosetodes* Ulm., but the tuft of hairs on the basal joint of antennae and fork 5 in the hind wings are absent in the genus *Episetodes*.

### **Oecetis McLach.**

#### **Oecetis bengalica, sp. nov.**

(Text-figs. 31, 32.)

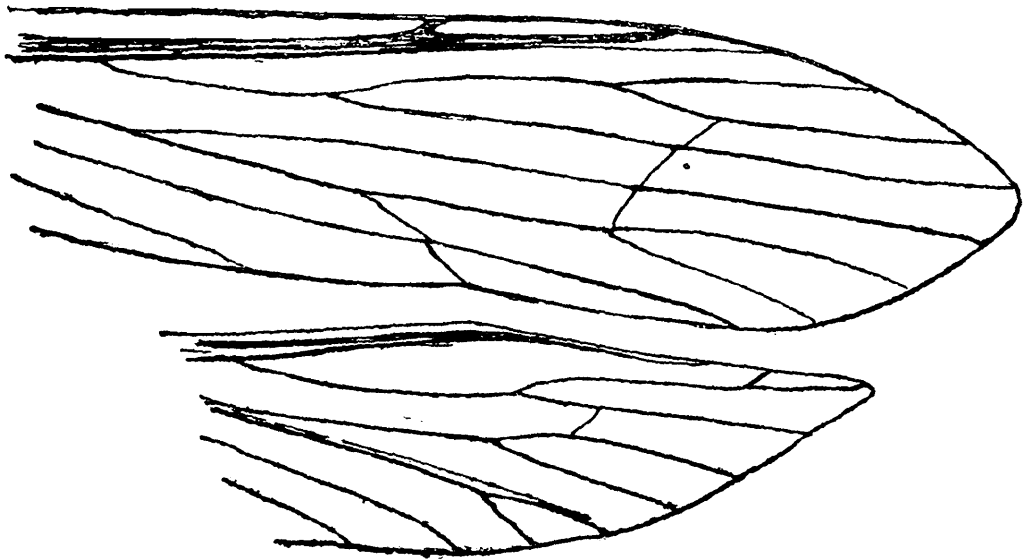
♂. Bihar, Katihar, Purneah district, 15.viii.10 ; C. Paiva (in spirit).

♂. Bihar, Katihar, Purneah district, 7-31.viii.10 ; C. Paiva (dry specimen).

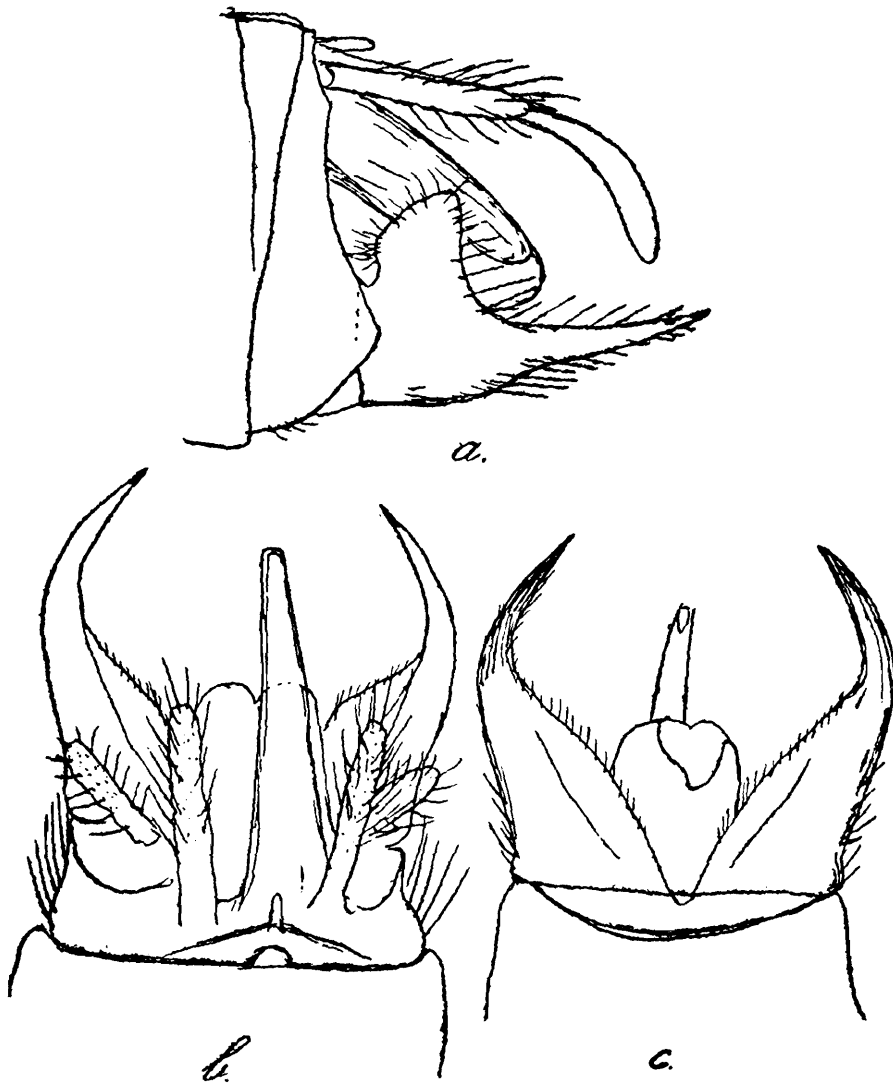
Head pale yellow ; antennae yellow with thin brown annulations, basal joint bulbous, pale. Thorax brownish yellow ; legs yellow, ends of tibiae and of tarsal joints white. Anterior wings brownish, densely clothed with yellow hairs ; in the middle of wing, however, there are two almost transverse brownish bands, formed by brown hairs, with admixture of white ones ; in the distal half are situated four small blackish spots, in the basal half only one or two such spots are perceptible ; at the ends of apical sectors brownish dots with concolorous fringe ; hair-clothing usually long. Venation similar to that in *Oecetis scutata* Ulm. but  $RS_{1+2}$  dividing earlier, before the end of the elongated discoidal cell ; SC thick, strong, connected with the fore margin by a short cross-vein far before its end ; three cross-veins forming one oblique vein (anastomosis).

Posterior wings greyish, iridescent, fringe brownish yellowish ; 1st fork small, M dividing at the same level with RS ; cross-vein rs-m oblique,

connecting  $RS_{3+4}$  with  $M_{1+2}$ ; before CuA may be seen feeble remains of MP.



TEXT-FIG. 31.—*Oecetis bengalica*, sp. nov., ♂; wing venation.



TEXT-FIG. 32, a-c.—*Oecetis bengalica*, sp. nov., ♂; genital appendages from side (a), from above (b) and from beneath (c).

♂. Abdomen pale. Side pieces of the 9th segment forming obtuse angles at the bases of the pedes genitales; tergite very narrow, with

a minute pale process in the middle. Preanal appendages digitiform, more slender than in *Oe. scutata* Ulm. 10th segment forming a very long, narrow, pale process in its apical portion curved downwards; seen from above, it is gradually narrowed behind. Penis thick directed somewhat downwards. Pedes genitales, seen from beneath, are broad at base, then gradually narrowing; end portions slender, acute at ends and somewhat curved inwards; seen from the side, they form at base a broad plate-like projection above; distal portion narrow, directed backwards.

Length of body 4.7 mm.

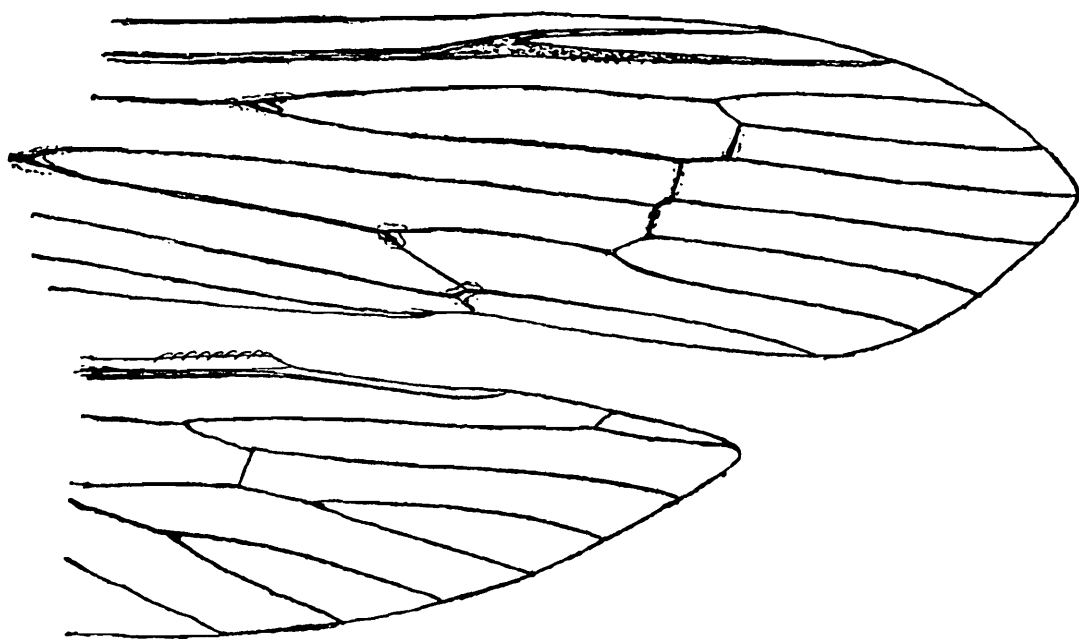
*Remarks.*—This species is very similar to *Oe. scutata* Ulm. from South Sumatra in the structure of the ♂ genitalia, but differs in some details. The preanal appendages are more slender, the penis is without appendages, and the pedes genitales are also somewhat different.

### ***Oecetis scutulata*, sp. nov.**

(Text-figs. 33, 34.)

4 ♂♂. Rewa State, opposite the camp at Harra, 2,625 ft., iii.27; H. S. Pruthi.

Very similar and closely allied to *Oe. scutata* Ulm. from Sumatra. Anterior wings as in that species, with similar brown spots at the angles of the forkings and along the veins of anastomosis; venation similar.

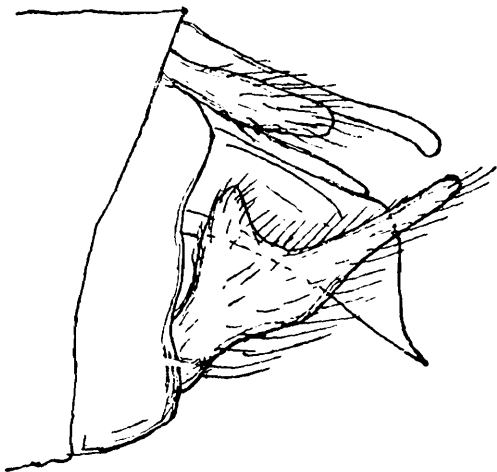


TEXT-FIG. 33.—*Oecetis scutulata*, sp. nov., ♂; wing venation.

Posterior wings also as in *Oe. scutata*, but the 5th fork is a little longer (text-fig. 33).

♂. Preanal appendages and 10th segment as in *Oe. scutata*; basal projection or process of the pedes genitales more distinct, more separated than in *Oe. scutata*; distal portion straight from side, curved inwards; penis acute at end as in *Oe. scutata*.

*Remarks.*—Although closely allied to *Oe. scutata*, *Oe. scutulata*, sp. nov. differs to some extent in the wing venation and in some details of the structure of the male genitalia.



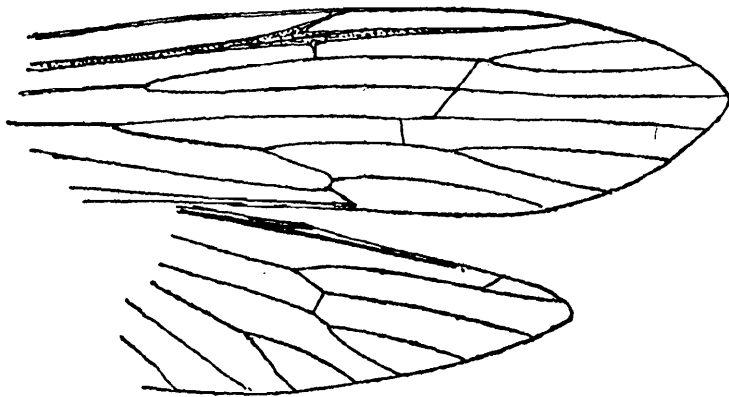
TEXT-FIG. 34.—*Oecetis scutulata*, sp. nov., ♂; genital appendages from side.

***Oecetis biramosa*, sp. nov.**

(Text-figs. 35, 36.)

♂. Orissa, Balighai, near Puri, 16-20.viii.11; N. Annandale and F. H. Gravely (in spirit).

Head yellow, antennae yellow, with narrow black annulations, thorax brownish yellowish, legs pale yellow. Anterior wings pale greyish yellowish; venation resembling that of *Oe. bengalensis*, sp. nov., but DC is longer and fork 1 is shortly pedicellate; 1st and 2nd cross-veins

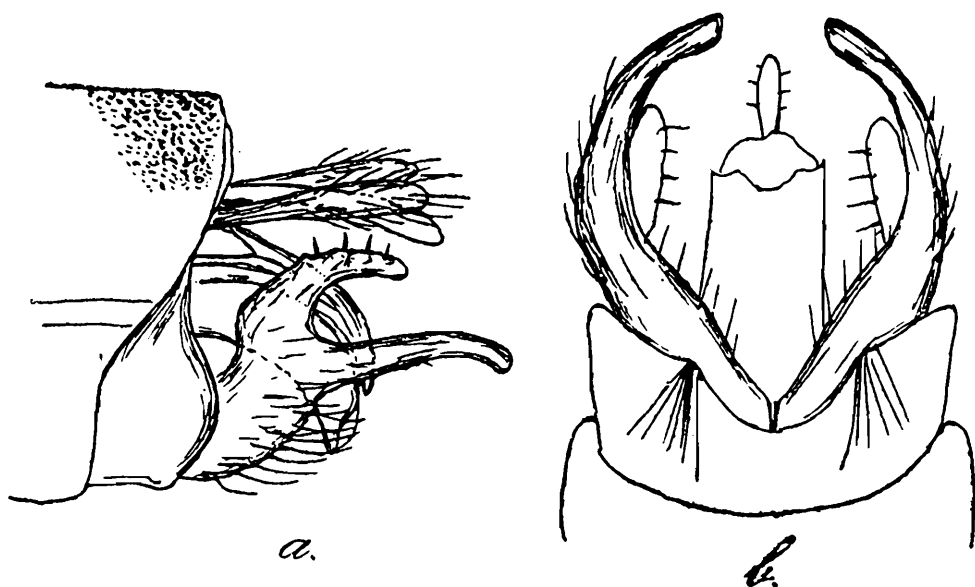


TEXT-FIG. 35.—*Oecetis biramosa*, sp. nov., ♂; wing venation.

of anastomosis forming an oblique line, as in *Oe. bengalensis*, but the 3rd cross-vein transverse, not oblique, and is situated before the 2nd vein. In the posterior wings fork 1 short, forks of M and CuA shorter than in the preceding species. Abdomen pale.

♂. Tergites of the 8th, 7th and parts of the 6th segments rough, covered with minute pits, as in *Oe. scutata* and *Oe. scutulata*. Median upper appendage of 10th segment straight, only a little longer than preanal appendages, which are somewhat narrowed in the basal portion,

pale, hairy. In the pedes genitales upper basal projection extended into a long and thick digitiform process, directed backwards and bearing



TEXT-FIG. 36, a, b.—*Oecetis biramosa*, sp. nov., ♂; genital appendages from side (a) and from beneath (b).

few spinules above; distal portions of pedes genitales also digitiform, but longer, directed backwards; seen from beneath they are rather slender, arcuate before ends, each adorned with a blackish line on its inner side. 10th segment covering penis from above, resembling apparently that in *Oe. scutata*, but details of its shape are not very clear. Penis arcuately curved downwards, not acute from side.

Length of body about 5 mm.

*Remarks.*—This species also belongs to the group *scutata-bengalensis*.

### ***Oecetis* sp. 1 (*jacobsoni* Ulm. ?).**

♀. U. Burma, Lonton, western shore of Indawgyi Lake, Myitkyina district, 18-31.x.26, at light; B. N. Chopra.

♀. Bihar, Katihar, Purneah district, 7-31.viii.10; C. Paiva.

Venation of wings, their colour-pattern and colouring of the body are absolutely similar to those in *Oecetis jacobsoni* Ulmer (*Treubia* XI, Livr. 4, 1930, p. 465, fig. 132) and I therefore consider these specimens as probably belonging to this species. It is, however, impossible to insist on this opinion, as in the genus *Oecetis* similar colour-pattern and venation of wings may exist in closely allied, but distinct species. It is not improbable that these specimens represent a new species closely allied to *Oe. jacobsoni* Ulm. from Sumatra.

### ***Oecetis* sp. 2.**

♀. Bihar, Kierpur, Purneah district, 8-11.ix.15; C. Paiva.

♀. Bihar, Kierpur, Purneah district, 12.ix.15; C. Paiva (in spirit).

Thorax brownish, with yellowish hairs; legs yellow. Anterior wings clothed with rather long, yellow rufescent hairs; on the ends of  $RS_{1+2}$ ,  $RS_{3+4}$ , M CuA and at anastomosis are seen four brushes of longer hairs,



the end portions of which are white; brownish spots may also be seen at the ends of apical sectors, at the base of DC, at the commencement of CuA (near its union with M); brown spot before the end of SC. In the hind wings, which are broad enough, the hairs are also rather long; fork of M rather long, but with a short pedicel; fork 5 shorter than it.

Length of body 4.6 mm.

*Remarks.*—This is probably a new species, but I consider it useless to name it from a single female, without giving a description of the genitalia.

### **Oecetis** sp. 3.

♀. Calcutta, 1912; F. H. Gravely.

Anterior wings long, narrow, with dusky pterostigma; fork 1 sessile, impinging a little on DC, which is long; cross-vein rs-m situated before irs and scarcely visible, cross-vein m-cu quite lacking. In the posterior wings the fork of M very short; before CuA a trace of MP.

Body yellow, antennae pale yellow, with thin annulations; wings yellowish.

Length of body 4.2 mm.

*Remarks.*—This is a distinct form, differing in the reduction of two cross-veins of anastomosis. It is probably a new species.

### **Setodellina** Lestage, 1919 (s. emend.).

1919. *Setodellina*, Lestage, *Rev. Zool. Afric.* VI, fasc. 2, p. 209, fig. 5 (*S. albopunctata* Lest.).

Closely allied to *Oecetis* McLach. In the anterior wings SC and R in their greater part united into one thick vein; SC with a branch anteriorly; discoidal cell elongated, but the thyridial cell usually longer than it; 1st apical fork sessile or shortly pedicellate; anastomosis usually gradate. In the posterior wings 1st and 5th apical forks and the fork of M very short, fork 1 sometimes entirely absent.

♂. Preanal appendages broad and united into one thick plate, usually bilobed at end; pedes genitales elongated, rather narrow, with a prominence or short process above near the middle of the upper margin, penis thick, curved downwards.

♀. In the female also preanal appendages united into one transverse thick plate; lateral lobes of 9th segment large, composite, with inner portions curved upwards and very broad, and having from the side the shape of two high plates; lower parts hairy, concave upwards, spoon-shaped; median portion of 9th sternite sometimes separated and ending in a small median process (*S. mahadeva* Bks.).

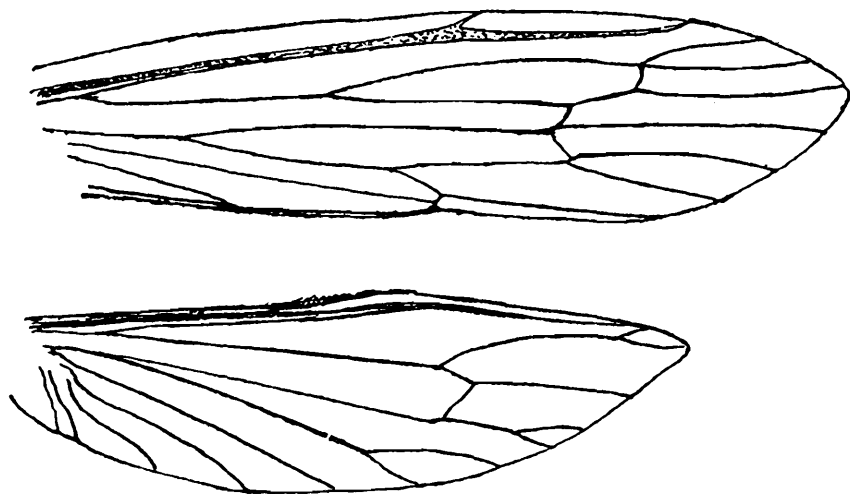
*Remarks.*—This Indo-African genus is related to *Oecetis*. I refer to it *Setodellina albopunctata* Lestage, *Setodellina brunnescens* Ulm., *Setodellina* (*Oecetis*) *gradata* Ulm., *Setodellina* (*Oecetis*) *maculipennis* Ulm., *Setodellina indivisa*, sp. nov., *Setodellina tenuis*, sp. nov., *Setodellina angustipennis*, sp. nov. and *Setodellina* (*Oecetina*) *mahadeva* (Bks.). The first four species occur in Africa, the remaining four in India.

**Setodellina indivisa**, sp. nov.

(Text-figs. 37, 38.)

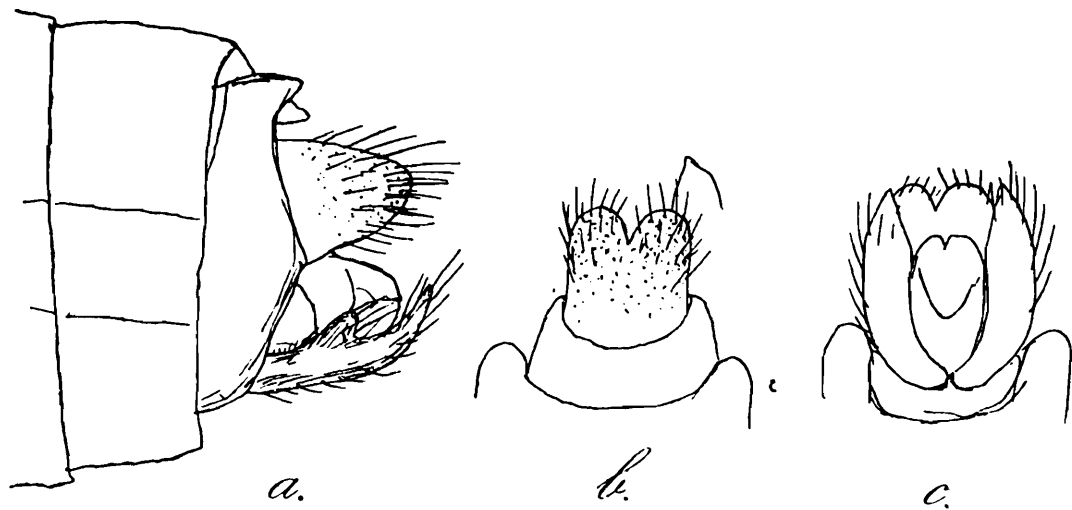
♂♂♀ (about 20 specimens in spirit, 1 sp. dry). U. Burma, Lonton, western shore of Indawgyi Lake, Myitkyina district, 18-31.x.26; B. N. Chopra.

Head brownish yellowish, antennae yellow, with black annulations; thorax brownish above, median portion of mesonotum paler, sides of thorax and coxae brownish yellowish; legs yellow. Anterior wings pale greyish yellowish, venation dark yellowish; SC thick, R slender in its basal part, then uniting with SC; far before the end of R, Sc is connected with C by an oblique vein; DC elongated, fork 1 sessile;

TEXT-FIG. 37.—*Setodellina indivisa*, sp. nov., ♂; wing venation.

rs-m situated at the base of 3rd discoidal cell; cross-vein oblique and situated between cross-vein m-cu and the base of  $M_{3+4}$ . In posterior wings SC strong, its end portion uniting with R; fork of M very small, cubital fork somewhat larger; 1st fork very small and not infrequently completely lacking. Abdomen yellowish.

♂. 9th segment as usual, broad at sides; preanal appendages large, triangular, oval from side, coalesced into a plate, which at its end is divided by a median excision into two oval lobes; the plate is clothed

TEXT-FIG. 38, a-c.—*Setodellina indivisa*, sp. nov., ♂; genital appendages from side (a), from above (b) and from beneath (c).

with hairs. Inferior appendages resembling in their shape those in *Oecetis paula* McLach. and in *Oecetis tripunctata* McLach., with a short

oval process above near the middle ; seen from beneath they are rather broad, with triangular apical portions. Penis strongly dilated at its end.

♀. At the end of abdomen there are two large and broad oval lobes, curved upwards.

Length of body 4.5 mm.

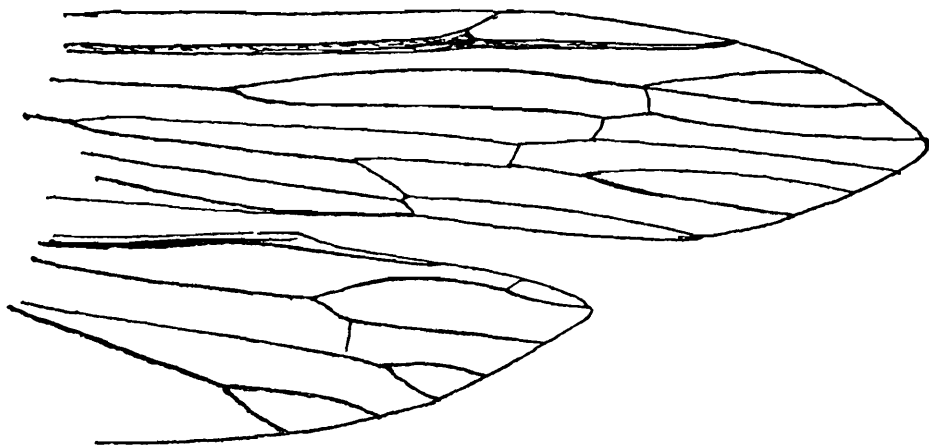
*Remarks.*—*S. indivisa* is evidently allied to *S. maculipennis* Ulm., *S. gradata* Ulm. and *S. brunnescens* Ulm. and all these species may be referred with *S. albopunctata* Lest. to the genus *Setodellina*. According to Lestage *Setodellina* differs from the allied genera mainly in the absence of fork 1 in the posterior wings. However, this fork is very small in *S. maculipennis*, *S. gradata* and in *S. indivisa*, sp. nov., and in the last named species it is rather inconstant, present only in a few specimens, being absent in others. Thus, this fork appears to be variable and in a condition of reduction, and its presence or absence cannot be considered as a generic feature. In other features, in the wing venation and in the structure of the genitalia all these species are similar to each other and therefore should be considered as belonging to the same genus for which the name *Setodellina* may be used.

***Setodellina tenuis*, sp. nov.**

(Text-figs. 39, 40.)

5 ♂♂, 3 ♀♀. Rewa State, opposite the camp at Harra, iii.27 ; H. S. Pruthi (in spirit).

Head and thorax brownish ; antennae yellow with brown annulations ; coxae brownish, legs yellow. Anterior wings narrow, greyish yellowish (in spirit) ; SC+R yellowish brownish, as also CuA and M in their basal parts ; DC long, narrow, thyridial cell a little longer ; fork 1 acute, but sessile ; anastomosis gradate ; fork of M with a short pedicel.

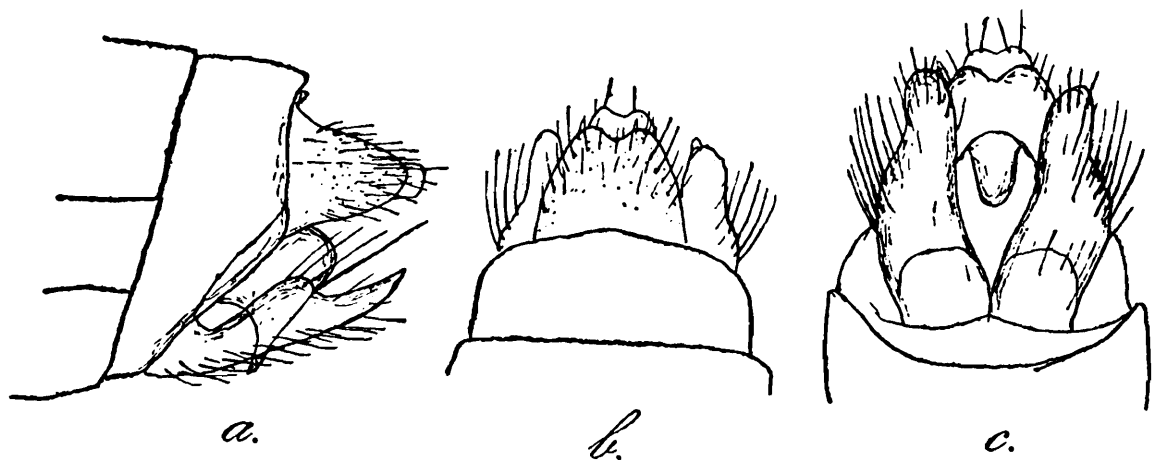


TEXT-FIG. 39.—*Setodellina tenuis*, sp. nov., ♂ ; wing venation.

Posterior wings not very narrowed ; fork 1 small ; fork of M also short, but broader ; fork 5 a little longer than the 3rd ; fringe on the anterior margin yellowish-brownish. Abdomen pale yellowish.

♂. Preanal appendages large, subtriangular and rounded at the end when seen from the side ; they are completely coalesced into a plate, which is narrowed at its end when seen from above ; apex shallowly

excised in the middle. Behind this plate the end portion of 10th segment may be seen, which is pale, transparent and also excised at



TEXT-FIG. 40, a-c.—*Setodellina tenuis*, sp. nov., ♂; genital appendages from side (a), from above (b) and from beneath (c).

its end. Pedes genitales broad from beneath, apical portion a little narrower; seen from the side they are narrower and directed backwards; they form above, near the middle, a broad low projection, bearing behind 3-4 bristles. Penis very broad, its end portion turned downwards and attenuated when seen from the side; seen from beneath the end portion is tongue-shaped, rounded at its end.

In the female the genital appendages have the same structure as in the preceding species, but their shape cannot be properly judged as the preservation of the specimens is very poor.

Length of ♂ body 5.4 mm., that of ♀ 4 mm.

*Remarks.*—Judging by the structure of the ♂ genitalia *Setodellina tenuis* sp. nov. is closely allied to *S. brunnescens* Ulmer from Sudan. Wing venation is also similar, but DC in forewings is longer in *S. tenuis*; posterior wings in our species are very similar to those in *S. brunnescens* and differ only in  $RS_{1+2}$  being forked, whereas in *S. brunnescens* this fork is completely reduced. This is a good demonstration of the opinion that the presence or absence of the small fork 1 cannot be of any great systematic importance.

### ***Setodellina angustipennis*, sp. nov.**

(Text-figs. 41-43.)

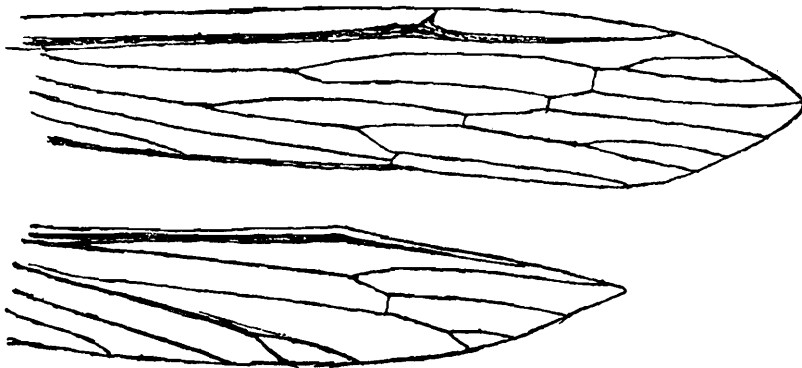
2 ♂, ♀. Mokameh Ghat, at light (in spirit).

Head and thorax yellow; antennae yellow with narrow brownish annulations; legs yellow, spurs 0.2.2, inner ones longer than the outer.

Anterior wings narrow, pale, membrane nearly iridescent; SC thick, R approximated to it and united with it at the end; discoidal cell very long, thyridial cell a little shorter, 1st fork with a short pedicel, 5th apical cell also pedicellate. In the posterior wings 1st fork is absent, fork of mediana very short, that of CuA also short.

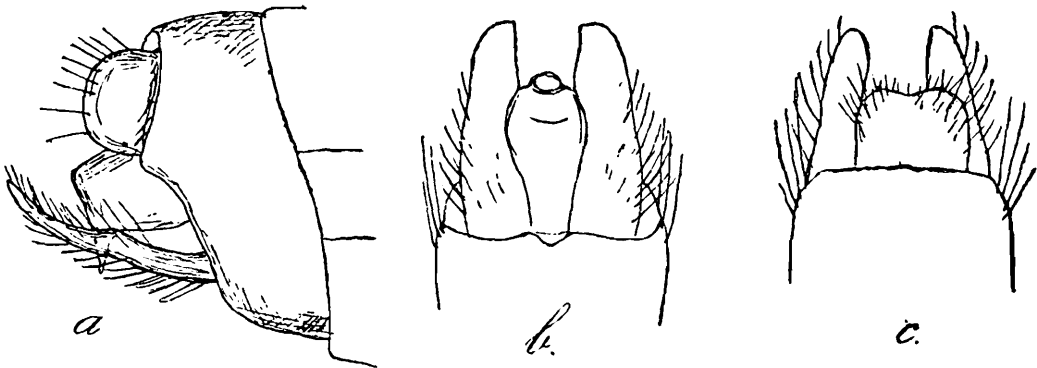
Abdomen pale,

♂. 9th segment broad; preanal appendages rounded from side, united into a parallel-sided plate, shallowly excised at end; pedes genitales



TEXT-FIG. 41.—*Setodellina angustipennis*, sp. nov., ♂; wing venation.

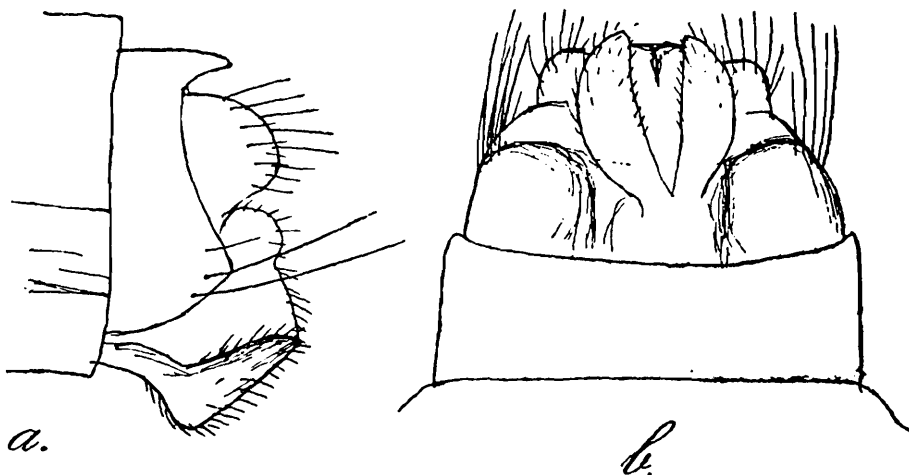
somewhat resembling, from side, those in *S. gradata* Ulm., but more slender; seen from beneath they are rather broad, band-shaped, with



TEXT-FIG. 42, a-c.—*Setodellina angustipennis*, sp. nov., ♂; genital appendages from side (a), from beneath (b) and from above (c).

somewhat excised inner margin; penis broad, with an acute process at its end below (seen from side).

♀. Preanal appendages united together in a plate, like *S. mahadeva* (Bks.); lateral lobes of the 9th segment large, resembling those in *S.*



TEXT-FIG. 43, a, b.—*Setodellina angustipennis*, sp. nov., ♀; genital segments and appendages from side (a) and from beneath (b).

*mahadeva*, but their hind edge is not concave, only slightly incised, separating a rounded upper lobe; seen from beneath they are elongated,

rounded externally and originating together from the pale, not separated, median portion of the 9th segment.

Length of body 4.4-5 mm.

*Remarks.*—This species appears to be more allied to *S. gradata* Ulm. from Egypt and Sudan.

***Setodellina mahadeva* (Bks.).**

(Text-figs. 44, 45.)

1913. *Oecetina mahadeva*, Banks, *Trans. Amer. Ent. Soc.* XXXIX, p. 236 (Chapra, Bihar).

2 ♀. Bihar, Siripur, Saran, 25.ix.10; Museum Collector.

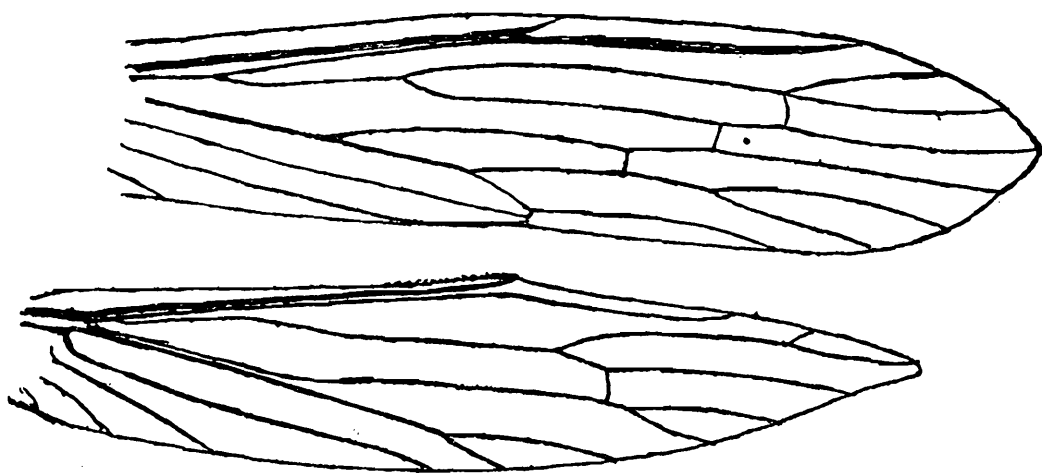
♀. Bihar, Kierpur, Purneah district, 8-14.ix.15; C. Paiva.

3 ♀. U. Burma, Lonton, western shore of Indawgyi Lake, Myitkyina district, 18-31.x.25, at light; B. N. Chopra (one specimen without abdomen).

♀. Bihar, Katihar, Purneah district, 7-31.viii.10; C. Paiva.

Head brownish, clothed with pale yellow hairs; palpi with a whitish pubescence; antennae brownish yellowish, bases of joints paler, ends blackish; distal half of antennae brownish, basal joint yellow.

Thorax brown, somewhat paler at sides; legs yellow. Anterior wings: membrane greyish, clothed with yellowish hairs; there are several dark brown short streaks or spots as follows: (1) a streak along M, between two cross-veins; (2) a less distinct streak at the base of  $RS_{3+4}$ ; (3) a streak along the basal part of M, up to the level of the base of the discoidal cell; (4) a small brown spot on the end of CuA; moreover, brown spots are sometimes found at the end of SC, at the base of RS and at the end of R. Venation brownish, SC brown, thick, giving a branch forward, then uniting with R into a very thick vein; discoidal cell long, 1st fork sessile, anastomosis gradate; thyridial cell beginning earlier than DC, but shorter than it.

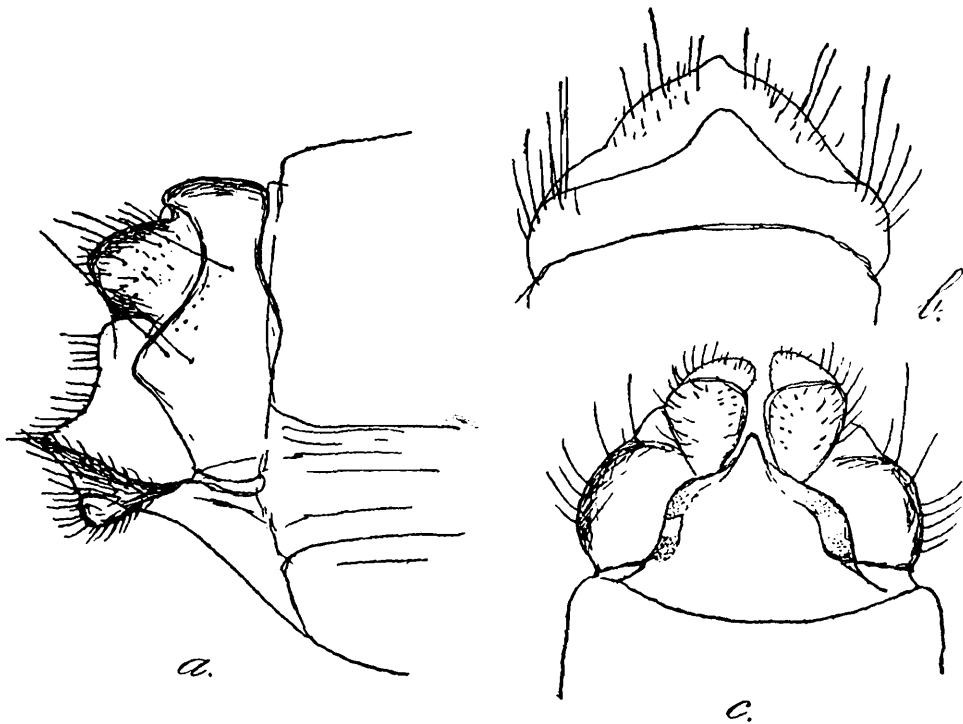


TEXT-FIG. 44.—*Setodellina mahadeva* (Bks.), ♀; wing venation.

Posterior wings greyish rufous, iridescent, with brownish fringe; venation pale brownish; SC ending on the projection of the fore margin; RS in its basal portion running near to R, then deviating from it; M in its basal half also running near to CuA, then deviating; fork 1 small, forks 3 and 5 small and nearly equal. Abdomen brown.

♀. 9th segment of usual shape, forming two triangular projections at sides and one rounded triangular above; preanal appendages coalesced

into a thick transverse hairy plate, situated behind 9th tergite; lateral lobes (of 9th segment) large, irregular from side, but with concave hind



TEXT-FIG. 45, *a-c.*—*Setodellina mahadeva* (Bks.), ♀; genital segments and appendages from side (*a*), from above (*b*) and from beneath (*c*).

edge of the upper portion; seen from beneath they represent two broad, subtriangular rounded lobes with narrow bases; their inner portions are curved upwards and form two high pale plates, seen from side; outer edges are also a little curved upwards, and thus a spoon-shaped structure is formed, hairy and triangular from the side. 9th sternite sub-divided into two side pieces and a median broad portion<sup>1</sup> ending in a small triangular projection between the bases of the lateral lobes of 9th segment.

Length of body 3.4-4 mm.

Males not known.

*Remarks.*—The specimens described above are probably to be referred to *Oecetina mahadeva* Bks., but since the original description of Prof. Banks is unfortunately not accompanied by any figure of wing venation or of genitalia, I cannot be certain. Our specimens resemble Banks' description in the presence of brown streaks on M and on the base of  $RS_{3+4}$ . In the specimens before me some other brown markings are also present, but they are rather variable and sometimes even absent. Specimens from Siripur and Katihar are small, with the length of body 3.4-3.7 mm. and 4 mm. respectively. In the specimen from Katihar brown markings on wings are distinct, and this specimen is, therefore, more closely allied to the specimen described by Prof. N. Banks.

*Remarks.*—The structure of the ♀ genital segments and appendages is peculiar; however, other species of *Setodellina* possess similar structures, differing only in some details.

<sup>1</sup> This is not a true sternite but its appendages which are coalesced with it.

**Trienodes** McLach.**Trienodes indica**, sp. nov.

(Text-figs. 46a-c.)

2 ♂. S. India, Kodaikanal, 6,900 ft., Palni Hills, viii. 22, at light; S. W. Kemp (in spirit).

Head brownish-yellow, paler at sides near eyes; antennae yellow, with brown annulations. Thorax brownish yellowish above, pleural regions and coxae brownish; legs yellow, femora somewhat darker. Anterior wings pale, yellowish, with usual venation. Abdomen pale yellow; 9th segment and pedes genitales darker, brownish yellowish.

♂. Preanal appendages not very long, more than twice shorter than the median appendage of 10th tergite. 9th segment broad in its ventral portion, very narrow in its dorsal portion; side pieces broadly excised above the base of the pedes genitales. 10th segment covering only the basal half of the penis, moderately broad at base, then narrow, acute at end; median basal process of 10th tergite long, slender, arcuate from



TEXT-FIG. 46, a-c.—*Trienodes indica*, sp. nov., ♂; genital appendages from side (a), from above (b) and from beneath (c).

side, somewhat thickened in its end portion. Pedes genitales elongated and broad from side, with upper and lower edges subparallel; their hind upper portions each prolonged into a process, which at its end is curved downwards. Seen from beneath the inferior appendages are cone-shaped, truncated at their ends, but at their outer upper angles each extended into a narrow process, which has been described above in the side view; near the base of the upper edge of each appendage is a small and very slender process visible from the side. Penis very long, curved downwards, accompanied at sides with two slender sickle-shaped appendages, representing, probably, its titillators.

Length of body 3.6 mm.

*Remarks*.—This is a distinct species apparently allied to *Tr. hastata* Ulm.

**Trienodes ornata** Ulm.

(Text-fig. 47.)

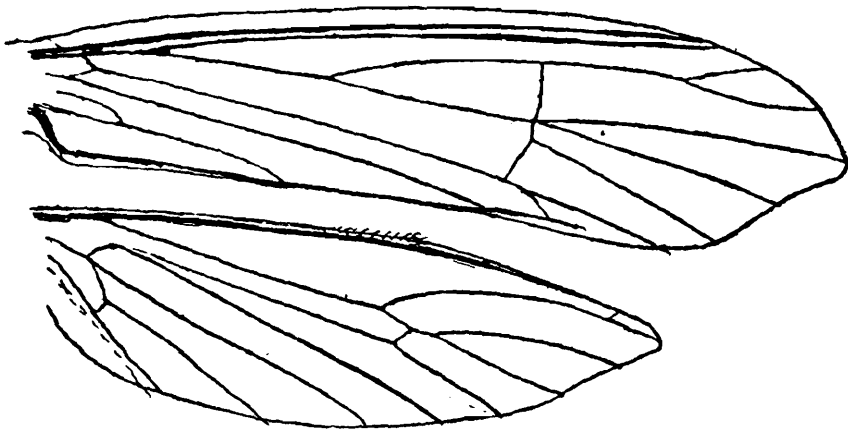
1915. *Trienodes ornata*, Ulmer, *Deutsch. Ent. Zeitsch.* p. 57, figs. 30-31.

2 ♀. Ceylon, Peradeniya, 8.vi.10 (in spirit).

Head, thorax and abdomen pale yellowish; antennae and palpi pale, legs pale, spurs 2.2.2.



Anterior wings as in Ulmer's figure 30, but the hind apical margin is a little excised, concave; venation similar to that in the figure 30,



TEXT-FIG. 47.—*Triaenodes ornata*, Ulm., ♀; wings.

but the apparent fork 2 is sessile, although acute; in the posterior wings apparent fork 2 with a short pedicel; hairs set off.

Length of body 6.6-2 mm.

*Remarks.*—I believe that these specimens belong to *Tr. ornata* Ulm. which was described from Peradeniya.

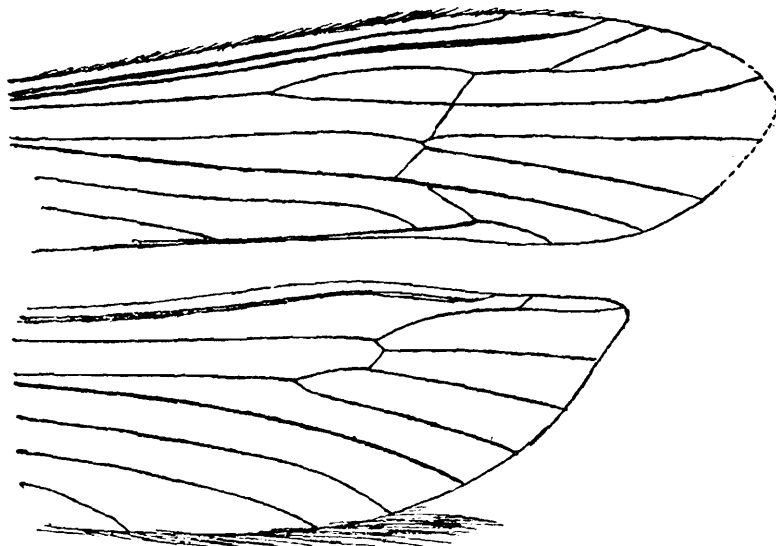
#### **Adicella** McLach.

#### **Adicella biramosa**, sp. nov.

(Text-figs. 48, 49.)

♂, Assam, the Peak, Shillong, 8,400 ft., 12.x.14; S. W. Kemp (in spirit).

Head and thorax pale brownish yellow; antennae yellow, with narrow black annulations; on the vertex near the eyes two brushes of long pale hairs; legs pale yellow, spurs 1.2.2. Anterior wings pale, clothed with yellowish hairs; venation dark yellowish; R thickened in its apical

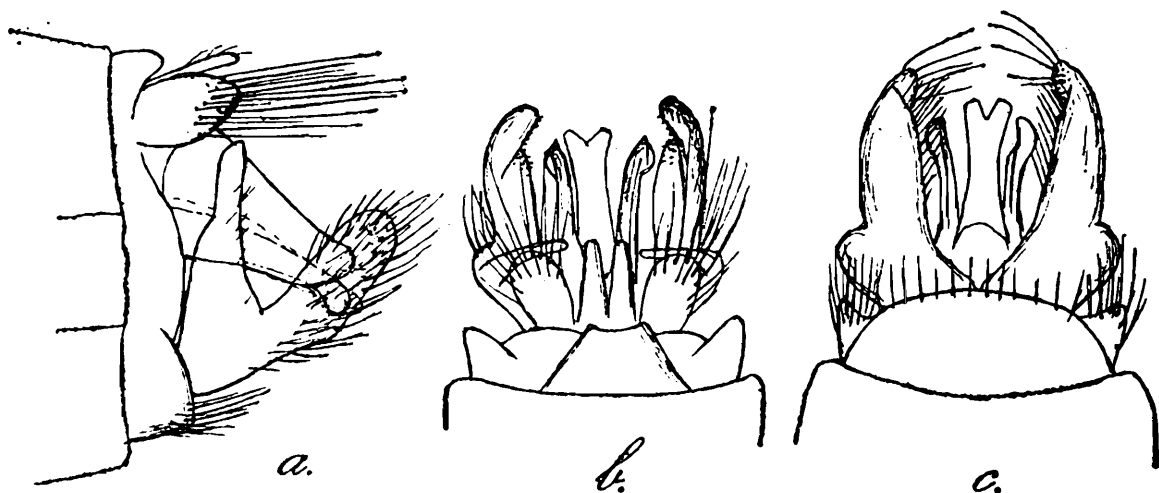


TEXT-FIG. 48.—*Adicella biramosa*, sp. nov., ♂; wing venation.

portion; DC short, fork 1 longer than its pedicel; three veins of anastomosis forming one oblique line; in the posterior wings M divides earlier

than RS, cross-vein rs-m situated not very near to this bifurcation. Abdomen pale yellowish.

♂. Preanal appendages broad, almost truncated behind, adorned with long hairs; at the base of 10th tergite are two digitiform short processes, equal in their length to the preanal appendages. Median portion of 9th tergite is more or less separated in the shape of a plate,



TEXT-FIG. 49, a-c.—*Adicella biramosa*, sp. nov., ♂; genital appendages from side (a), from above (b) and from beneath (c).

narrowed behind and with a concave hind edge. 10th segment descendent, near its base divided into two long side plates, which are broad in their basal part, but somewhat narrowed behind if seen from side; penis slender, concealed between these plates; at its end it appears to be sub-divided into two small side lobes, when seen from above. Pedes genitales divided near their bases into a main portion, directed backwards and somewhat upwards, and a basal process directed upwards; basal part of appendages thickened; main portions broad from side, hairy; internally they are covered with spinules, in the distal portions in particular; apical portions somewhat curved inwards; basal processes broad in the proximal and slender in the distal portions, latter curved inwards. 9th sternite rounded on its hind edge.

Females unknown.

Length of body 5.8 mm.

*Remarks.*—This is a distinct species which is more similar to the European *A. reducta* McLach. than *A. pulcherrima* Ulm. from Java, and *A. nigropunctata* Ulm. from Sumatra.

### **Mystacides** Latr.

#### **Mystacides indica**, sp. nov.

(Text-figs. 50 a-c.)

♂. Western Himalayas, Kumaon Hills, Malwa Tal, 3,600 ft., 7.v.11; S. W. Komp (in spirit).

Head brownish above, pale yellowish in front; antennae pale yellowish, with somewhat brownish annulations. Thorax brownish, legs brownish yellow. Anterior wings yellowish brownish with a little darker venation; venation similar to that in *M. longicornis* L. and in

other species; CuA darker than other veins; posterior wings somewhat paler. Abdomen pale.

♂. The structure of ♂ genital appendages resembles rather closely that in *M. dentata* Mart. from the Altai Mountains. 9th sternite forming a broad bifid process, representing a triangular hairy plate with concave hind margin. Preanal appendages as usual, long, straight, slender. 10th segment, seen from above, long and broad, thick and brown at sides, paler and slender in the middle; thickened lateral borders extending backwards in the shape of two processes, the right one long, curved at first to the left and upwards, then backwards and somewhat downwards, with the apices directed backwards; the left process is short, also acute



TEXT-FIG. 50, a-c.—*Mystacides indica*, sp. nov., ♂; genital appendages from side (a), from above (b) and from beneath (c).

at end. Seen from the side, 10th segment is broad at base, attenuated backwards and extending into the two above mentioned processes, of which the short left process is situated above the right. Pedes genitales broad from side, ascending, with an acute triangular projection from its upper portion, directed backwards; seen from above they are concave internally with slender and acute apical portions; at their bases, internally, are two broad plate-like projections, rounded at the ends. Penis thick in its proximal half, somewhat more slender in the distal half which is turned downwards; seen from above it is much broader than from the side.

*Remarks.*—This species is evidently rather closely allied to *M. dentata* from the Altai Mountains, differing from it in some details of the structure of the male genitalia.

### Family SERICOSTOMATIDAE.

#### Sub-family LEPIDOSTOMATINAE.

#### **Dinarthrum** McLach.

#### Sub-genus **Indodinarthrum**, nov.

Closely allied to *Paradinarthrum* Mart. and partly to *Metadinarthrum* and *Hypodinarthrum* McLach, but somewhat different. Basal joint in the ♂ antennae long, with the usual processes in the basal part. Anterior wings (♂) resembling those in *Paradinarthrum*, but the median groove is better developed; hind branch of M scarcely connected or

completely disconnected from M, and united with CuA; anal stripe well developed, but not extremely long, the cell between CuA<sub>2</sub> and M<sub>3</sub>+CuA<sub>1</sub> is triangular, not very extensive. Median portion of the 10th segment (♂) divided by a fissure into two plates; side portions not projecting, small, second joint of the pedes genitales longer.

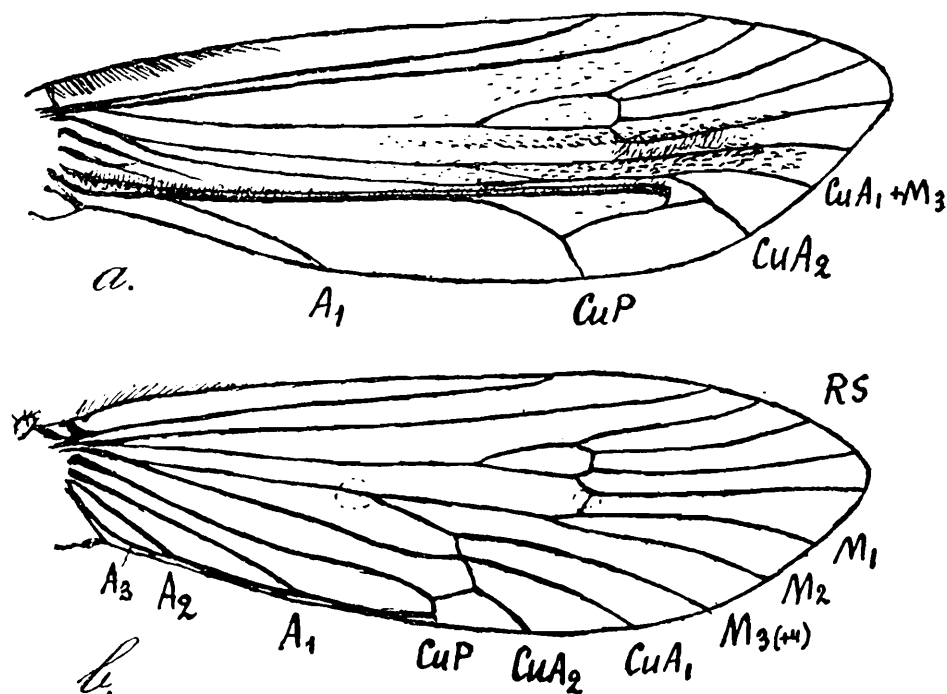
*Remarks.*—I refer to this sub-genus two species—*D. punjabicum*, sp. nov. and *D. latum*, sp. nov. both from the Punjab; the second species is also represented by a specimen from Darjeeling, Eastern Himalayas.

***Dinarthrum (Indodinarthrum) punjabicum*, sp. nov.**

(Text-figs. 51, 52.)

11 ♂, 6 ♀. Punjab, Punj-pul Nullah, about a couple of miles from Dalhousie on Dalhousie-Bakloh Road, 6,500 ft., v.27; S. L. Hora.

♂. Head and thorax brown above, head transverse. Basal joint of ♂ antennae brown, nearly as long as the thorax and abdomen, curved, directed forwards and clothed with rufescent hairs and outstanding thickened hairs; it bears at its inner side two processes, the basal long and curved and the second shorter, thread-like, yellowish, annulated with brown. 1st joint of ♂ maxillary palpi long, second shorter, slender. Coxae brownish, legs yellow, or somewhat brownish; tarsal joints darker at their ends. Anterior wings greyish-brown, clothed with yellowish rufous hairs and with black scales before and behind the longitudinal subdiscoidal groove; whitish spots of hairs at the end of SC, somewhat nearer to the base and at the end of M. Venation somewhat resembling that in *D. ferox* McLach.; discoidal cell rather short, but somewhat variable. M weak, dividing at the base of discoidal cell into the fore branch, reaching the end of wing, and the weak hind branch soon uniting with CuA to form a common vein, then separating and forming



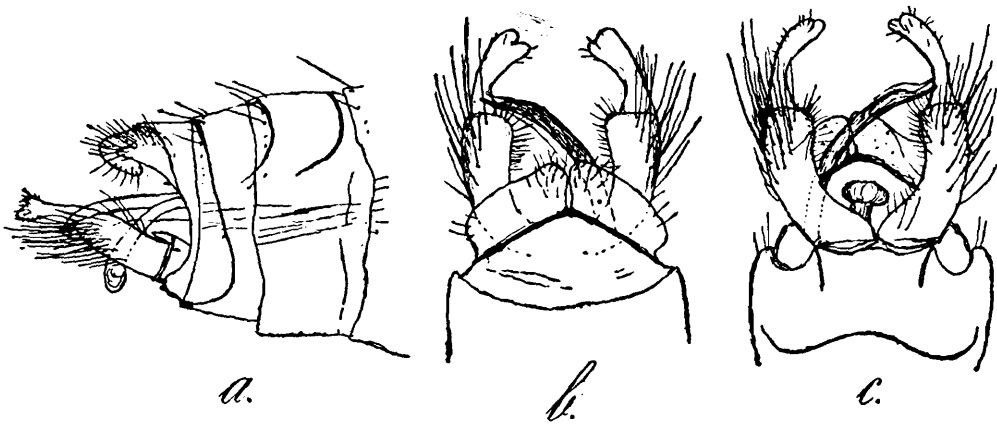
TEXT-FIG. 51, a, b.—*Dinarthrum (Indodinarthrum) punjabicum*, sp. nov., (a) fore-wing of ♂; (b) fore-wing of ♀.

probably M<sub>3</sub>+CuA<sub>1</sub>. Anal groove or stripe straight, distinct and extending a little beyond the end of DC; basal portions of CuP and of A<sub>1</sub>

present; fork 5 (between  $M_3 + CuA_1$  and  $Cu_2$ ) somewhat variable, but usually rather short (text-fig. 51); apical cell between the ends of  $CuA_2$  and  $CuP$  extended, elongated; in the posterior wings discoidal cell sometimes closed by a cross-vein; sparse blackish scales present. In females DC in the anterior wings is also short,  $CuP$ ,  $A_1$ ,  $A_2$  and  $A_3$  connected behind by a postcostal vein, running near the hind edge of the wing; forks 1, 2, 3 and 5 present; basal joint of ♀ antennae twice shorter than in ♂, without processes.

Abdomen dark brownish.

♂. Side pieces of 9th segment with concave hind margins; 9th tergite almost triangular, with dark hind edge; 10th dorsal segment not entire, but divided by a median fissure into two portions, which, from above, are band-shaped, with hind margins nearly parallel to the hind edge of



TEXT-FIG. 52, a-c.—*Dinarthrum* (*Indodinarthrum*) *punjabicum*, sp. nov., ♂; genital appendages from side (a), from above (b) and from beneath (c).

9th tergite; side portions not projecting above. Second joint of pedes genitales elongated, slightly thickened in its distal portion; end part sub-divided by a small incision above into two small lobes (text-fig. 52b).

Penis curved downwards; titillators originating from the left side of the penis; they are rather thick and curved to the right.

In ♀ anterior wings DC is also short, forks 1, 2 and 3 beginning at the same level.

Length of body 4 mm.

*Remarks.*—This species resembles *D. (Paradinarthrum) longiplocatum* Mart. and *D. (P.) mesoplicatum* Mart., but differs somewhat in the structure of ♂ genitalia, as also in the venation of anterior wings in ♂.

### ***Dinarthrum* (*Indodinarthrum*) *latum*, sp. nov.**

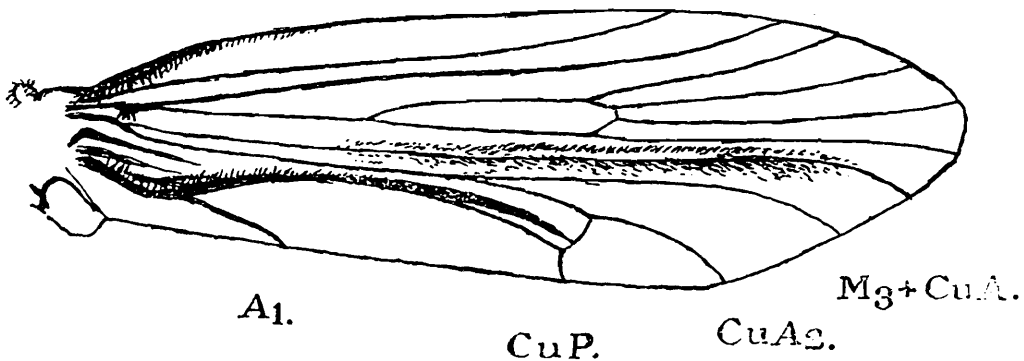
(Text-figs. 53, 54.)

♂. Punjab, Punj-pul Nullah, about a couple of miles from Dalhousie on Dalhousie-Bakloh Road, 6,500 ft., v.27; S. L. Hora.

♂. Eastern Himalayas, Darjeeling, 11.vi.14; F. H. Gravely (defective specimen).

Similar and related to the foregoing species. Basal joint of antennae nearly as long as the whole body, armed with two processes in the basal

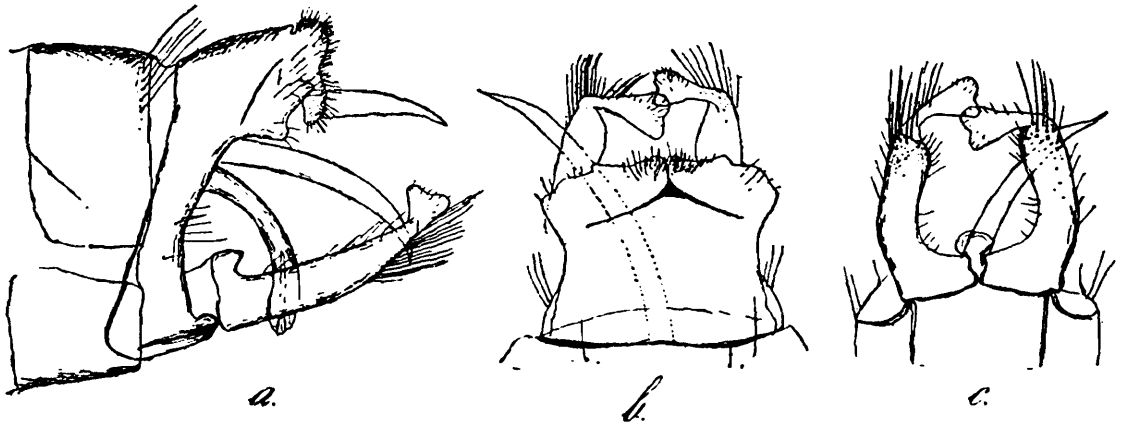
part. Anterior wings, as in *D. (I.) punjabicum*, sp. nov., but discoidal cell is longer, the cell between  $M_3 + CuA_1$  and  $CuA_2$  much longer, cell



TEXT-FIG. 53.—*Dinarthrum (Indodinarthrum) latum*, sp. nov., fore-wing of ♀.

$CuA_2$ — $CuP$ , on the contrary, not as extended; anal stripe with spinules and scales, a little shorter and somewhat arcuate.

♂. Dorsal plate of the 10th segment short, with irregular hind margin; from the side the 10th segment is higher than in *D. punjabicum*.



TEXT-FIG. 54, a-c.—*Dinarthrum (Indodinarthrum) latum*, sp. nov., ♂; genital appendages from side (a), from above (b) and from beneath (c).

Basal joint of the pedes genitales more elongated, second joint more dilated at its end; titillators also curved to the right.

Length of body 5.5-5.3 mm.

### **Dinarthroides Ulm.**

#### **Dinarthroides inequalis**, sp. nov.

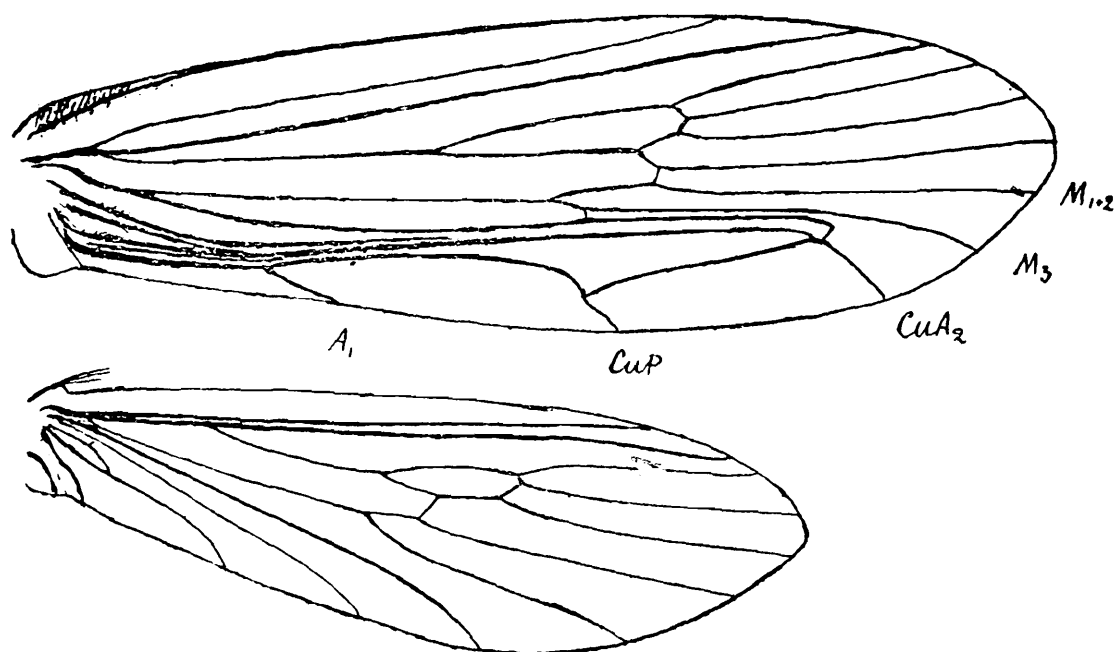
(Text-figs. 55-56.)

2 ♂, ♀. Western Himalayas, Kumaon Hills, Bhowali, bushes and trees, 12.v.30; H. S. Pruthi.

Head and thorax brown; head transverse; basal joint in ♂ antennae long, but shorter than the body, curved inwards, without any spines. Maxillary palpi densely clothed with greyish and black elongated scales, apparent basal joint probably represents an outgrowth of the palpiger; second (first) joint slender and directed upwards, third (second) joint slender, shorter than the foregoing. Labial palpi pale, fairly long, as usual three-jointed.

♂. Anterior wings greyish-yellow; DC elongated, but shorter than its pedicel; M dividing into two branches at the middle of DC,  $M_{3+4}$  near its base connected with a short cross-vein with  $CuA$ ; this

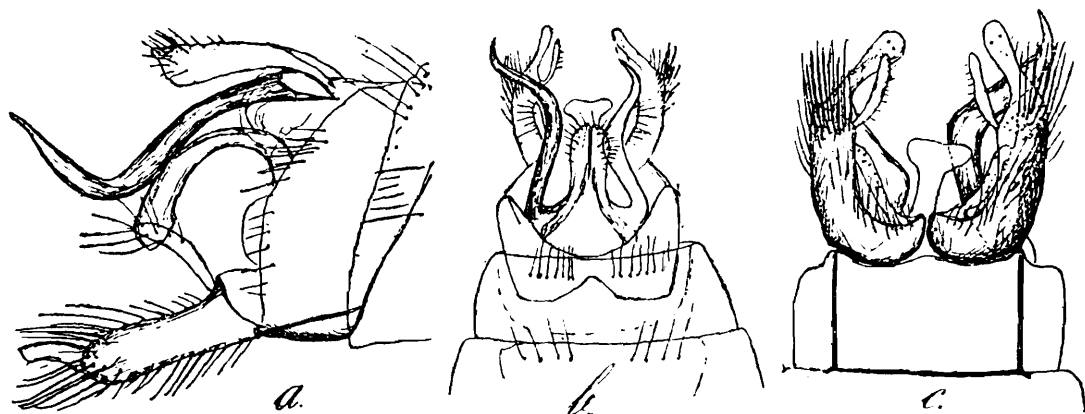
vein is long and curved at its end backwards and then prolonged with  $CuA_2$ ;  $CuA_1$  absent; cross-vein between  $CuA_2$  and  $CuP$  long; before  $CuP$



TEXT-FIG. 55.—*Dinarthodes inequalis*, sp. nov., ♂; wing venation.

and the basal part of  $A_1$  is the anal groove with hairs, concealing the venation in the basal part. Posterior wings greyish, DC subelliptical; cross-vein  $rs-m$  connecting basal parts of  $RS_{3+4}$  and  $M_{1+2}$  (text-fig. 55).

♂. 9th segment broad, narrowed above; side pieces with convex hind margins; sternite provided with two brownish lateral, straight, chitinous thickenings. Median portion of 10th segment elongated, with a narrow cleft divided into two portions, bearing short erect hairs; seen from the side this portion of the 10th segment is narrow at base, gradually thickening to its end. Side portions of 10th segment (morphologically they probably represent preanal appendages) extended as two long sinuate processes of unequal length, the left being considerably shorter



TEXT-FIG. 56, a-c.—*Dinarthodes inequalis*, sp. nov., ♂; genital appendages from side (a), from above (b) and from beneath (c).

than the right. The right process is directed backwards, then curved upwards and outwards; acute end portion is turned backwards; the left process is curved in a similar manner, but its end portion is directed somewhat inwards.

Basal joint of the pedes genitales brown, thick, straight, bearing on its end portion a tuft of long bristles; second joint pale, almost twice shorter, slender in its middle, at base uniting with first joint; internally from it originates the inner slender branch, and from the base of the first joint arises on each side another pale slender process, directed rather upwards. Penis slender, arcuately curved downwards (titillators invisible, probably shortened or absent).

♀. Anterior wings brownish, venation as usual in females; forks 1, 2 and 5 present. Basal joint of antennae somewhat longer than the head with eyes.

Length of body about 5.5 mm.

*Remarks.*—Allied to *D. albardana* Ulm. but distinct, differing mainly in the structure of the 10th segment.

### **Dinarthrella** Ulm.

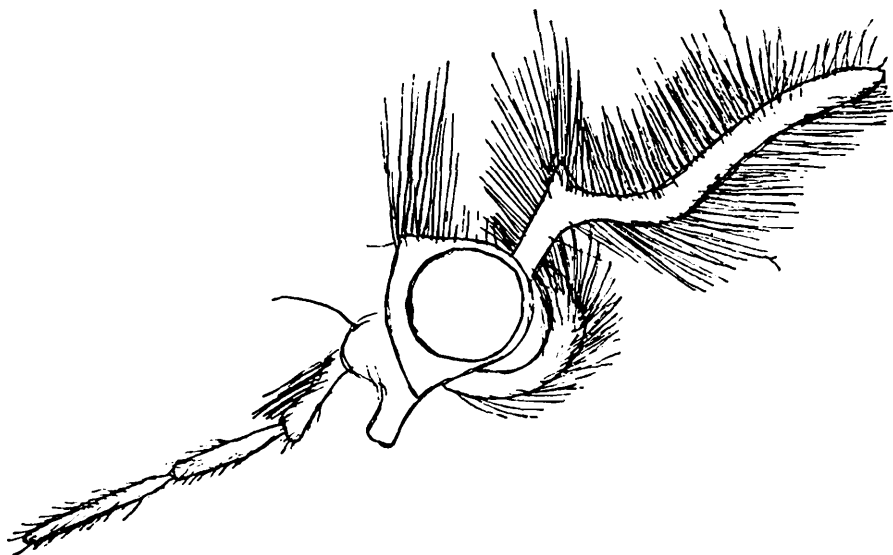
#### **Dinarthrella betteni**, sp. nov.

(Text-figs. 57-59.)

1 ♂. Eastern Himalayas, Pashok, Darjeeling district, 3,500 ft., 1-12.x.17; F. H. Gravely (in spirit).

The specimen is young and pale; colouring in fully adult specimens would be darker.

Head pale, clothed with dense pale, greyish-yellow hairs, with some admixture of brownish ones near the eyes. Basal joint of antennae as long as the thorax, slender, sinuate from side, pale, densely clothed above and beneath with dense, slender, erect, rufous brownish hairs; on the distal portion the hairs become paler, yellowish-grey; basal portion of the joint ending in a short triangular process or projection; thread pale yellow.

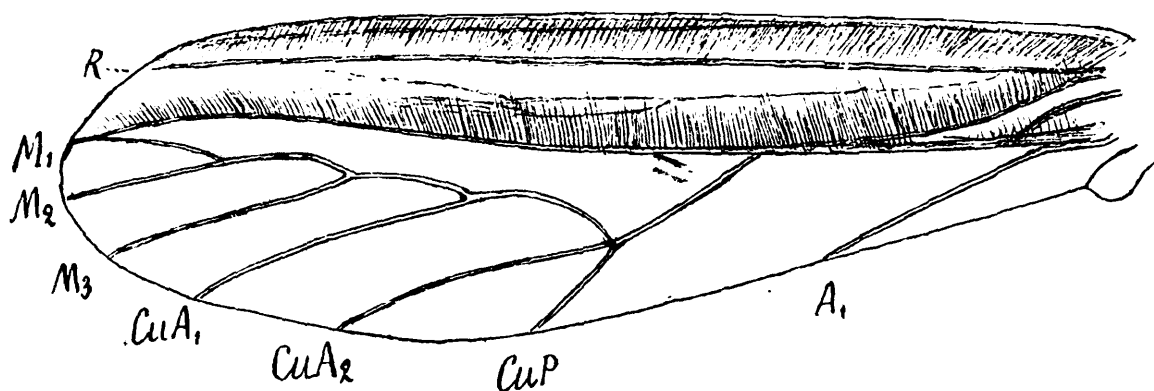


TEXT-FIG. 57.—*Dinarthrella betteni*, sp. nov., ♂; head with palpi and basal joint of antennae.

Maxillary palpi long, pale, adjacent to the head, curved upwards, their ends are situated between the bases of antennae and bear here a dense tuft of brownish-yellow hairs. Labial palpi long; 3rd joint longer than 2nd, which in its turn is longer than first.



Thorax yellow, mesonotum elongated, twice longer than the metanotum, brownish, with two rounded pale marks, bearing tufts of pale erect hairs; behind them two more small whitish spots. Metanotum brownish. Legs pale yellowish. Anterior wings pale, narrow; costa thick; subcosta running near to it, in its basal part apparently uniting with it with dense series of yellowish hairs turned backwards; this series is continuous with the hairs, arising from costa. R straight, thick; RS originating early from it and forming a narrow and short discoidal cell, concealed by hairs, starting from M and therefore not easily dis-

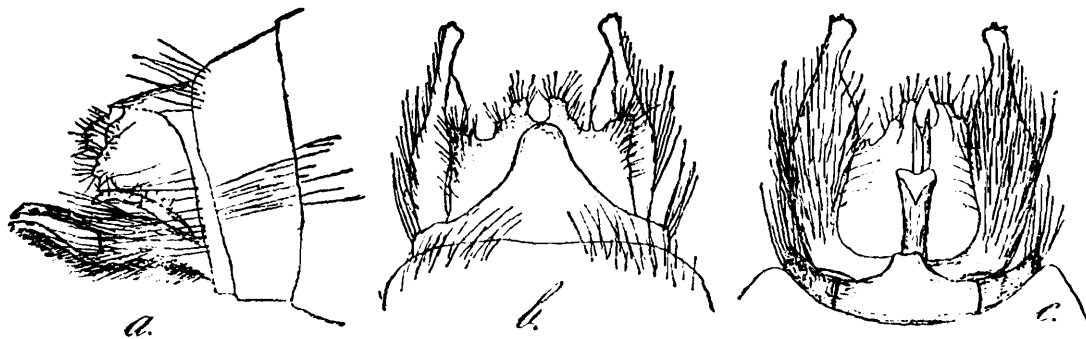


TEXT-FIG. 58.—*Dinarthrella betteni*, sp. nov., ♂; wing venation.

tinguished. Only the basal part of M may be discerned, since its further part is concealed by a long and distinct anal fold, extending from the base up to the end of  $M_1$ ; from the base of M and from the fold arise forwards dense series of brownish-grey hairs, as in *Dinarthrella destructa* Ulm. Venation behind this fold is much disturbed, as in *D. destructa*; three branches of M,  $CuA_1$ ,  $CuA_2$  and CuP connected basally and forming series of parallel (except CuP) veins; in the proximal part of wing there is only  $A_1$ , which is oblique, straight; jugal lobe rounded. Venation in posterior wings similar to that in *Dinarthrella* sp. Betten, 1909.

Abdomen pale brownish, tergites provided with dark transverse (slender) thickenings at their anterior edges; 1st tergite broad, brownish.

♂. Side pieces of 9th segment with straight hind edges; sternite narrow with a small median projection; tergite forming a broad projec-



TEXT-FIG. 59, a-c.—*Dinarthrella betteni*, sp. nov., ♂; genital appendages from side (a) from above (b) and from beneath (c).

tion narrowed behind and reaching the base of the median excision of 10th segment, broad both from above and from the side; one may distinguish here, as in *Dinarthrum*, one median and two lateral portions;

side portions short, irregular, hairy, separated from the median by two broad excisions, in which two more minute processes may be seen. Median portion also short, but with a rounded excision divided into two irregular projections, broad from side, narrower from above.

Pedes genitales broad from the side, hairy, divided near the middle into two branches, upper and lower, the lower being more slender and bearing beneath dense greyish brown hairs; seen from beneath the pedes genitales are dilated in the middle, then attenuated (lower branch); apices ending in two or three tubercles. From the bases of the pedes genitales arise two pale sabre-shaped processes, reaching the base of the upper branch. Penis short; above it two titillators, acute at ends.

Length of body 6 mm.

*Remarks.*—*Dinarthrella* sp. briefly described and figured by C. Betten (*Rec. Ind. Mus.* III, p. 241, pl. xviii, figs. 10-12, 1909) belongs probably to this species, although there is some difference in the shape of the basal joint of antennae and in the venation of the fore wings. DC and its branches are almost invisible in our specimen, but it is young, RS and M are here very pale and weak and therefore indistinct; Betten's figure of the basal joint of antennae is perhaps not quite correct (Betten's specimen was in bad condition). *Dinarthrella betteni*, sp. nov. is evidently allied to *D. destructa* Ulm. from Darjeeling, but distinct.

### **Maniconeura** McLach. (s. emend).

1815. *Maniconeura*, McLachlan, Fedtschenko's *Reise in Turkestan*, Zoology, Pt. 6. Neuroptera, p. 31.  
 1880. *Maniconeura*, McLachlan, *Monogr. Revisn. Synops. Trichopt. European Faun.* p. 280, pl. xxix, figs. 1, 2.  
 1913. *Crunoeciella* (Ulm.), Martynov, *Horae Soc. Entom. Ross.* XL, p. 27 (*C. batumica* Mart.).  
 1927. *Dinogoerodes*, Martynov, *Ann. Mus. Zoolog. Acad. Sci. U. R. S. S.* p. 469.  
 1927. *Crunoeciella*, Martynov, *ibid.*, p. 471.

Basal joint in male antennae rather short, approximately equal to the width of head with eyes, sometimes with a process at its base; basal joint of ♂ maxillary palpi elongated, bearing usually long hairs, second joint short, pale, directed backwards; labial palpi elongated as usual.

In ♂ anterior wings forks 1 and 2 present; discoidal cell elongated, thyridial one sometimes shortened; anal groove with hairs and scales situated near the posterior margin of wings, behind it no remains of any anal veins; at its end anal groove is continued with  $CuA_2$ , and when the groove is very long and distinct, transverse basal portion of  $CuA_2$  vanishes; two branches of M and  $CuA$  sometimes compressed before the groove.

♂. 10th segment divided into four or two processes; with the basal portion of the pedes genitales are connected two processes, one directed backwards, the other upwards; second joint diverse; near its base usually there is internally a slender furcate process.

*Genotype.*—*Maniconeura penicillata* McLach. (1875).

*Maniconeura penicillata* McLach. was insufficiently described from a single specimen which is not available in the Zoological Museum in

Leningrad. In 1935 I received a male specimen from Turkestan<sup>1</sup> which proved to be this species. An examination of this specimen showed that *Dinogoerodes relictæ* Mart. which I described in 1927 from Turkestan, is indeed very near to *M. penicillata*. I, therefore, propose to drop the name *Dinogoerodes* and unite it with *Maniconeura* McLach.

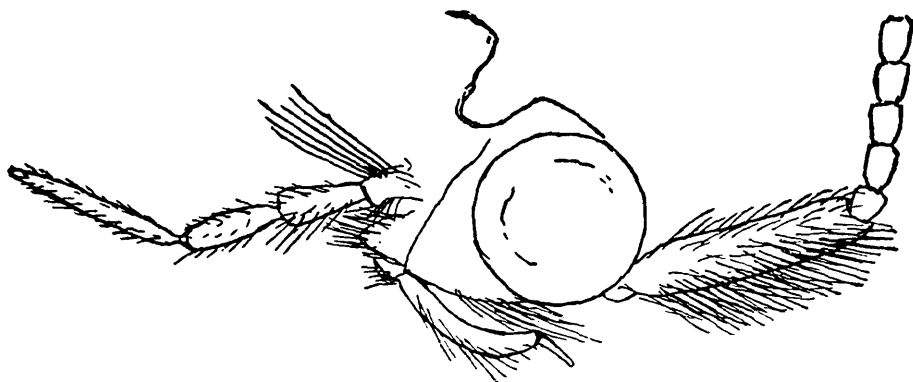
*Maniconeura indica*, sp. nov. described below proves to be evidently allied to both *Crunobiella* (*Crunoeciella*) *batumica* Mart. and *Maniconeura relictæ* Mart., thus uniting these two genera. As a result I have come to the conclusion that the genus *Crunoeciella* Mart. which is also monotypic, should be united with *Maniconeura* McLach. Four species of this genus are known, two from Russian Turkestan (*penicillata* McL. and *relictæ* Mart.), one from Transcaucasia (*batumica* Mart.) and one from India (*indica*, sp. nov.).

### ***Maniconeura indica*, sp. nov.**

(Text-figs. 60-62.)

2 ♂, 2 ♀. Peninsular India, Castle Rock, N. Kanara district, x.16; S. W. Kemp, (in spirit).

♂. Head transverse, pale brownish, with two rather large oval dark warts behind; basal joint of antennae yellowish, as long as the diameter of head, brownish, clothed with long dark hairs anteriorly; in female basal joint similar, a little more slender. Maxillary palpi directed up-



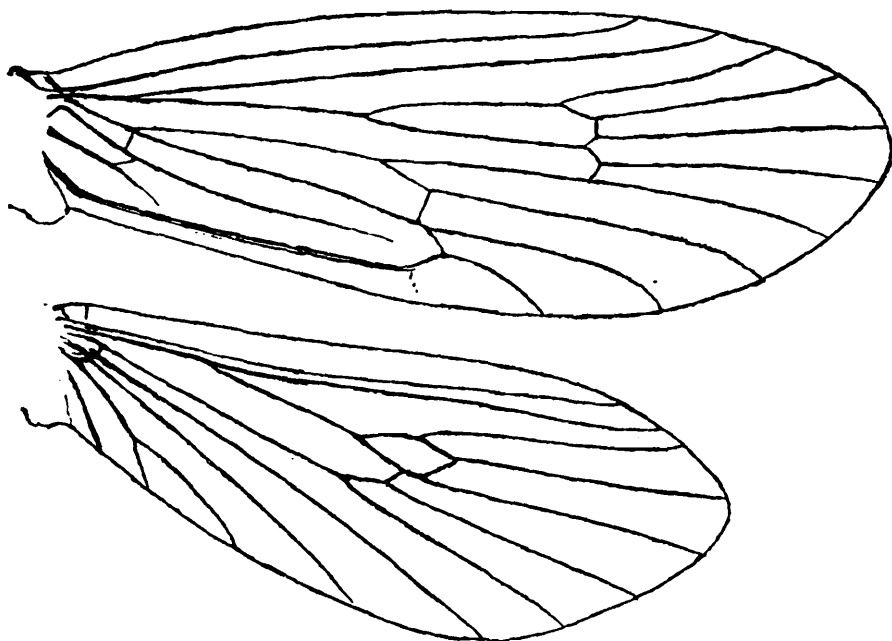
TEXT-FIG. 60.—*Maniconeura indica*, sp. nov., ♂; head with maxillary and labial palpi and with basal joint of antennae.

wards, but short, composed of elongated basal joint, and very short and slender second joint; labial palpi long, pale, 3rd joint nearly equal to 1st and 2nd combined. In female maxillary palpi long, 5th joint the longest, then follow 3rd, 2nd, 4th and 1st joints; labial palpi somewhat shorter than in males.

Thorax brownish, darker above, except median parts which are paler; legs pale. Membrane of anterior wings pale brownish, elliptic; venation brownish; DC elongated, but shorter than its pedicel, M divided into two branches almost at the level of the base of DC; thyridial cell elongated; CuA ending with a fork, CuP not reaching it; A<sub>1</sub>

<sup>1</sup> The specimen of *Maniconeura penicillata* shall be described in another paper.

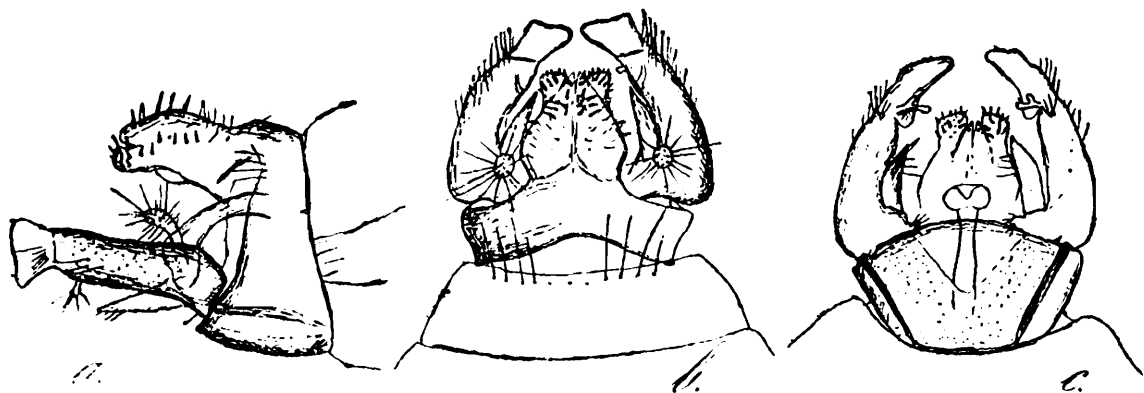
represented by its basal portion ; anal groove with hairs and spinules situated near the hind margin, at its end continued with CuA<sub>2</sub>, shorter



TEXT-FIG. 61.—*Maniconeura indica*, sp. nov., ♂ ; wing venation.

than in the remaining species. In posterior wings RS<sub>1</sub> deeply impinging on the discoidal cell. Wing venation in females resembling that in *M. batumica* Mart.

♂. 9th segment gradually dilating to its ventral part, which is very broad, with convex hind margin ; tergite produced backwards in the form of a short triangle, but pale ; 10th segment thick from side, broad above, separated from 9th tergite by a constriction ; its hind portion is composed of a median triangular portion, at its end with a short incision subdivided into two small acute lobules, and two side lobes, situated somewhat beneath the median ; both triangular portions armed, each with 6-7 erect thick yellow spinules ; side lobes also each bearing several similar but smaller spinules.



TEXT-FIG. 62, a-c.—*Maniconeura indica*, sp. nov., ♂ ; genital appendages from side (a), from above (b) and from beneath (c).

Basal joint of the pedes genitales fairly thick, somewhat curved inwards ; from its basal portion arise two processes : the upper is slender, directed upwards, at its end bearing erect hairs ; lower process is directed backwards, cuneiform, pale. 2nd joint short, plate-like

from side, dilated to its truncated hind margin (from side); it is more or less fused with the 1st joint, and from the point of fusion arises internally a small slender furcate process. Penis curved downwards, thickened at its end.

Length of ♂ body 4.5 mm., that of ♀ 5—5.5 mm.

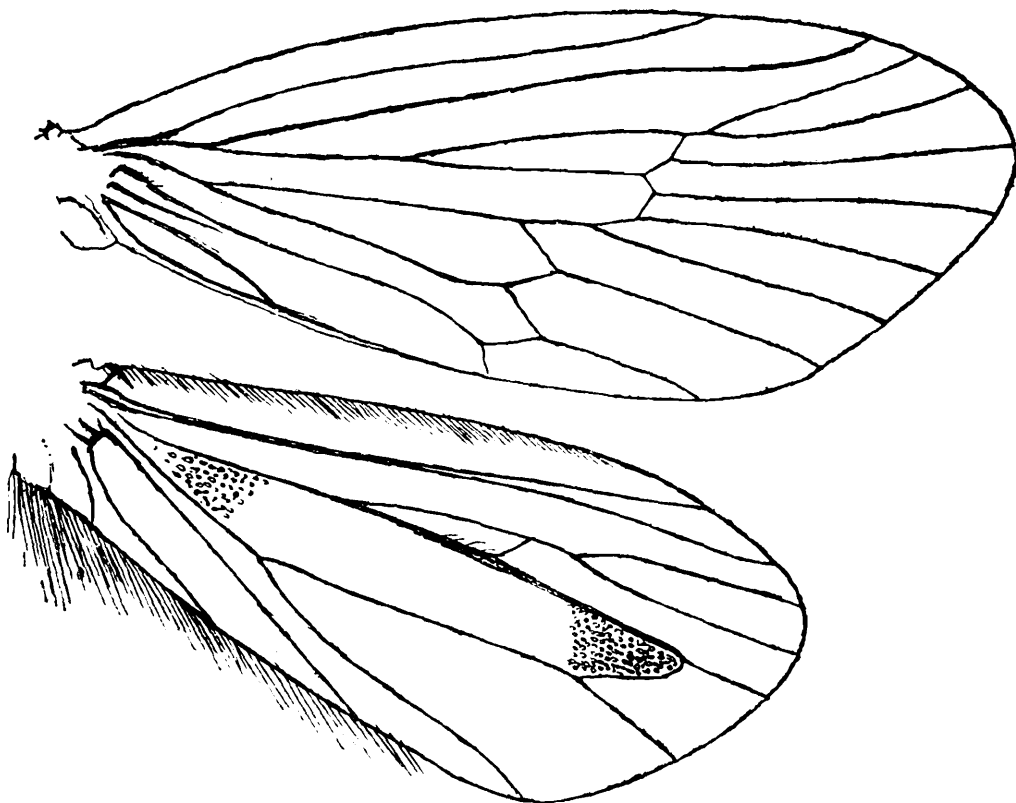
*Remarks.*—This species is distinct, but apparently allied more to *M. batumica* Mart. The thyridial cell in this species is much shorter, but M divides also at the base of DC; anal groove is longer in *M. batumica*, but is in the same situation and has the same structure as in *M. indica* sp. nov.; branches of M and CuA are not compressed as in *M. indica*. Male maxillary palpi are shortened and weakened in *M. indica*, their structure is similar to that in *M. batumica*. Second joint of the pedes genitales in *M. indica* shows a somewhat archaic condition as in *Dinarthrum*, but at its base there is a small forked process resembling a similar process in *M. relictata*. 10th segment is rather peculiar, but resembles the 10th segment of *M. batumica*.

***Paraphlegopteryx compositus*, sp. nov.**

(Text-figs. 63-65.)

♂. Eastern Himalayas, Darjeeling district, C. Lynch.

Head transverse, brown, mainly clothed with brown hairs mixed with a few yellowish hairs; basal joint of antennae short, in length



TEXT-FIG. 63.—*Paraphlegopteryx compositus*, sp. nov., ♂; wing venation.

equal to about three joints of the thread, the latter is brown, with pale annulations. Maxillary palpi very short, curved upwards, composed of a single joint, which is short, rounded at the end and armed with long hairs; labial palpi long, 3rd joint equal to 1st and 2nd combined.

Thorax brown, paler at sides; legs yellow, spurs 2.4.4. Anterior wings broad, egg-shaped, greyish yellowish, clothed with short yellowish hairs; in the region of pterostigma hairs darker. Venation pale brownish; DC elongated, narrow, closed by an oblique cross-vein; 1st fork with a short pedicel, 2nd sessile, triangular at base; 5th fork elongated, similar to that in *P. tonkinensis* Ulm., but its upper branch probably represents the united  $CuA_1 + M_{3+4}$ , fork 3 acute at base, mediana dividing near the middle of DC as in *P. tonkinensis*;  $A_1$  reduced,  $A_2 + A_3$  running close to the hind margin of wing. The membrane bears whitish scales. Posterior wings also broad, narrowing to the base, pale, almost hyaline; venation pale brownish; C bearing dense series of elongated hairs, directed backwards; SC and R approximated and apparently even fused in their middle portion; RS arising very early from the base of wing and forming a narrow discoidal cell, closed with an oblique vein; 1st fork also pedicellate. M fused with RS and  $RS_{3+4}$ , separating from it only at the discoidal cell; CuA forming a very long and broad fork, but the apical portion of its upper branch is composed of  $M_{3+4}$  and  $CuA_1$  fused together. Long area behind

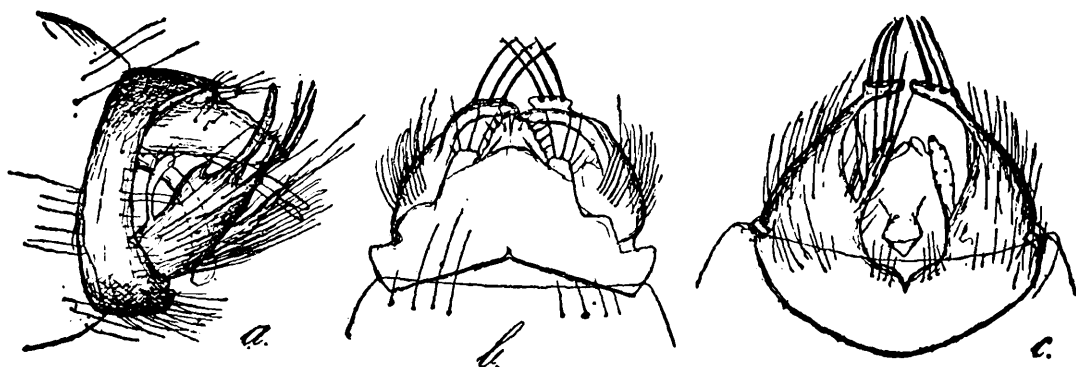


TEXT-FIG. 64, *a*, *b*.—*Paraphlegopteryx compositus*, sp. nov., ♂; (*a*) arrangement of scale in the hind wings; (*b*) four scales, more enlarged.

RS+M uniformly covered with numerous oval swollen scales, on its upper side bearing 5-6 costae, running parallel to one margin (fig. 64); at the base of wing there is anteriorly a short frenular spine.

♂. 9th segment with concave hind margins at sides; dorsal portion dilated, with somewhat gradate hind-lateral edges. 10th segment broad at base, if seen from side triangularly narrowing backwards; in its apical portion it is divided by a short cleft into two subtriangular lobes (above), bearing at sides a few acute spinules. At the base of 10th segment are seen two obtuse projections, bearing four long hairs; they probably represent preanal appendages. From under 10th tergite arise two long, pale, band-shaped appendages, probably belonging also to 10th segment. Pedes genitales composite, very thick at bases and almost

completely fused with 9th sternite. Seen from the side they are broad in the basal half, then divided into three processes of which the proximal



TEXT-FIG. 65, *a-c.*—*Paraphlegopteryx compositus*, sp. nov., ♂; genital appendages from side (*a*), from above (*b*) and from beneath (*c*).

one is short, the median long, digitiform and curved inwards; the distal process is a little shorter, slender, also curved inwards; it is thickened in its apical portion and bears behind three thick spines. From the basal part of pedes genitales arise two more processes, upper and lower; the upper is slender, directed upwards, covered with short thin hairs; inner lower process longer, thicker, and directed upwards and backwards; it bears long thick hairs. Penis slender, curved downwards.

Length of body 5 mm.

*Remarks.*—In this species the structure of the wing venation is evidently similar to that in *Paraphlegopteryx tonkinensis* Ulm. from Tonkin. I, therefore, refer it to this genus. *P. compositus*, sp. nov. differs from *P. tonkinensis* mainly in the more specialised venation of posterior wings; one-jointed maxillary palpi of ♂ are probably characteristic of the genus.

### **Indocrunoecia, gen. nov.**

Basal joint of antennae of ♂ not very long; basal joint of maxillary palpi long, directed upwards, bearing a tuft of long hairs; second joint very small or absent. Anterior wings broad, clothed with hairs and spinules (or elongated scales); DC elongated; forks 1, 2 and 3 present, CuA<sub>2</sub> lacking; CuP<sub>1</sub>, A<sub>1</sub> and A<sub>2</sub> approximated in the basal half. Posterior wings also bear black spinules, but the area between CuP and A<sub>1</sub> is densely clothed with minute scales; only fork 1 is present.

*Remarks.*—Allied to *Paraphlegopteryx* Ulm. but distinct.

*Genotype.*—*Indocrunoecia heterolepidia*, sp. nov.

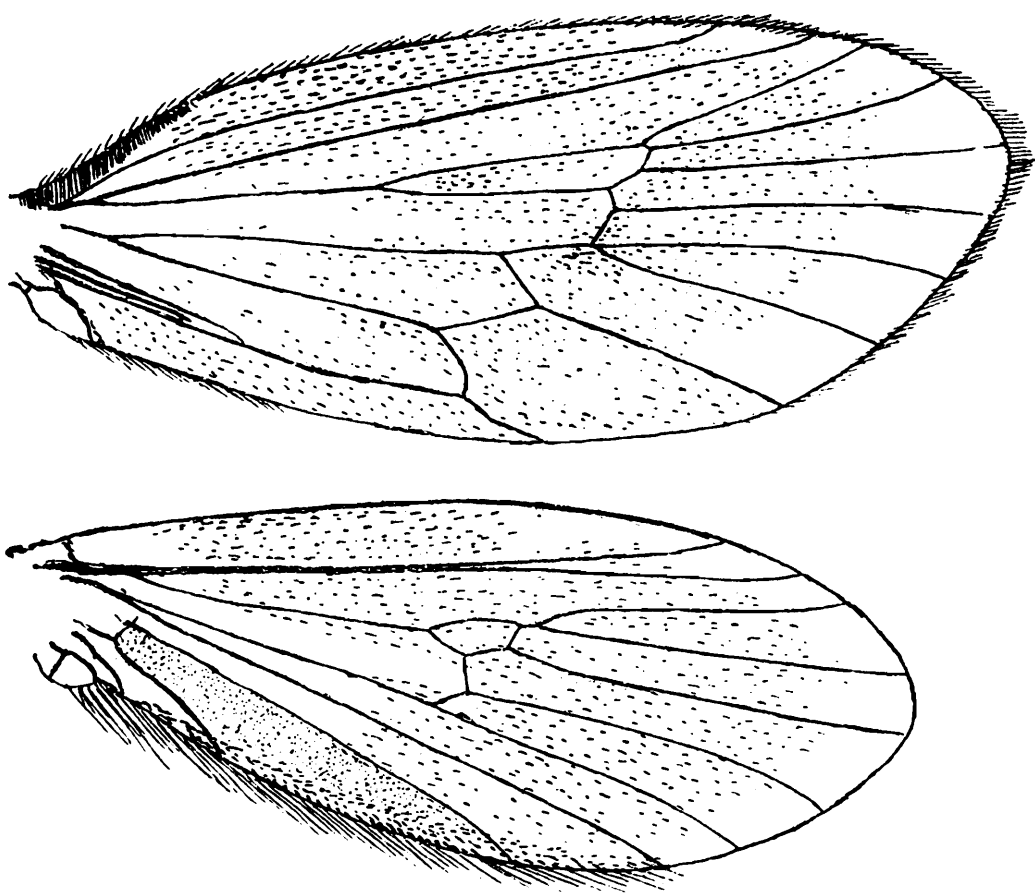
### **Indocrunoecia heterolepidia, sp. nov.**

(Text-figs. 66, 67.)

2 ♂, 2 ♀. Eastern Himalayas, Darjeeling district, C. Lynch (dry and in spirit).

Head and thorax brown; basal joint of ♂ antennae straight, as long as the diameter of the head with eyes, on the inner side and anteriorly

bearing dense brush of black hairs; thread paler, brownish. Basal joint of ♂ antennae long, ascendent, bearing on its inner side long black hairs; apical portion bears a long tuft of black hairs, directed backwards; 2nd joint imperceptible (probably very small); labial palpi somewhat shorter than the maxillary palpi, slender. Thorax brown, legs brownish. Anterior wings broad, egg-shaped, greyish yellow, with yellowish brown venation; membrane clothed with thin short yellowish pubescence and with small elongated black scales; costal vein in its basal part bearing brush of black hairs, turned backwards; venation somewhat resembling that of *Paraphlegopteryx* Ulm. but  $CuA_2$  absent, RS beginning at the very base of wing; 1st apical fork acute, but sessile; 3rd fork acute, beginning at the cross vein  $rs-m$ ;  $CuP$  not approximated to  $CuA$ , and close to it are situated a short groove (with  $A_1$ ?) and  $A_2$ , which is united at end with  $CuP$ .



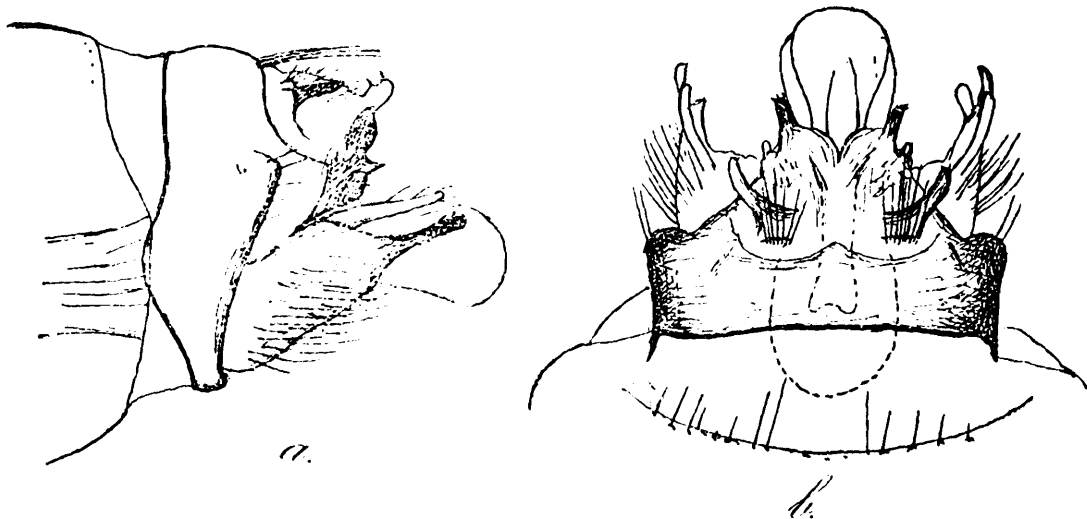
TEXT-FIG. 66.—*Indocrunoecia heterolepidia*, gen. et sp. nov., ♂; venation of wings.

Posterior wings broad, elliptic;  $SC+R$  partly united together, DC short, cross vein  $rs-m$  derived nearly from its middle;  $CuA$  simple, straight; area between  $CuP$  and  $A_1$  densely clothed with smaller, minute scales; the remaining part of wing clothed with elongated spinule-like scales, similar to those in the forewings. Abdomen brownish.

♂. 9th segment narrow in its ventral part, broader at sides. 10th segment short, but very broad, pale; seen from above it is very broad at base, narrowed behind; its apical portion with a median excision subdivided into two short lobes, bearing externally two short brown processes, which if seen from the side are rounded at their ends; at the



base of the segment there are, above, two dark stick-shaped processes, above the base of which are situated two short transverse ribs, bearing several bristles (preanal appendages?). Seen from the side 10th segment is broad, almost truncated at end and provided here with two



TEXT-FIG. 67, a, b.—*Indocrunoecia heterolepidia*, gen. et sp. nov., ♂; genital appendages from side (a) and from above (b).

more short conical processes. Pedes genitales broad from side, each ending in a dark process; above which is another similar pale stick-shaped process; internally there is a third small process; seen from beneath basal parts of the pedes genitales are very broad, bulbous. Penis very thick in its distal part, rounded at its end, pale.

♀. Basal joint of antennae shaped as in the male; maxillary palpi brownish; legs yellow. Venation of anterior wings resembling that of the male, but  $CuA_2$  present;  $CuP$ ,  $A_1$ ,  $A_2$ ,  $A_3$  present, of usual form; in posterior wings forks 1, 2 and 3 are present; discoidal cell short.

Length of body 5—5.6 mm.

*Remarks.*—*Indocrunoecia*, gen. nov. appears to be allied to the genus *Paraphlegopteryx* Ulm. and has some resemblance to it not only in the venation of forewings but also in the structure of the male genitalia. Pedes genitales are also very broad, with three processes at the end, as in *I. heterolepidia*, sp. nov., but the shape of the processes is different; 10th segment and penis are also different. I consider *I. heterolepidia* as belonging to a distinct genus.

### **Goerodes** Ulm.

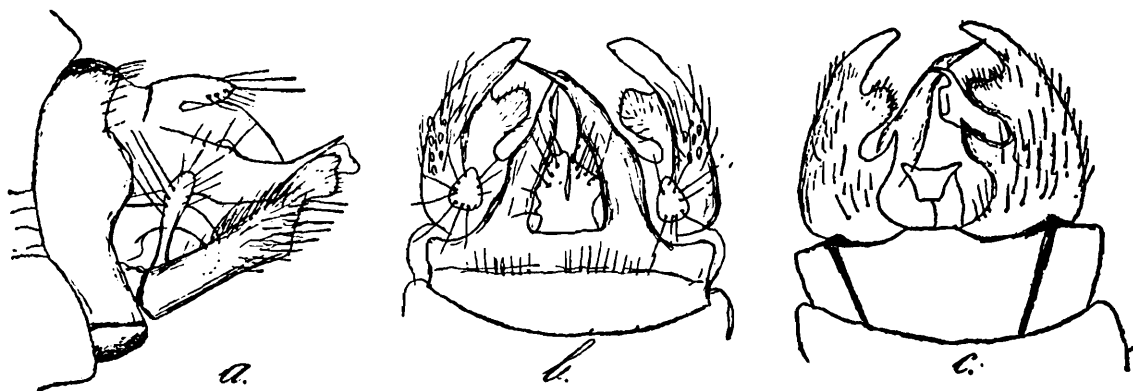
#### **Goerodes piscina** Hag.

(Text-fig. 68, a-c.)

♂. Ceylon, Pattipola (hill country), 6,000 ft. 13.x.11; N. Annandale (defective specimen, in spirit).

This species was described by Ulmer (*Deutsch. Ent. Zeitsch.* p. 68, figs. 45-47, 1915) from Pattipola, Ceylon. I have prepared three new

figures from this male specimen (text-fig. 68a-c). As can be seen from fig. 68b, the median plate of the 10th segment has in our specimen a



TEXT-FIG. 68, a-c.—*Goerodes piscina*, Hag., ♂; genital appendages from side (a), from above (b) and from beneath (c).

different shape. Nevertheless I do not think that it belongs to a distinct species.

#### Sub-family THREMMINAE.

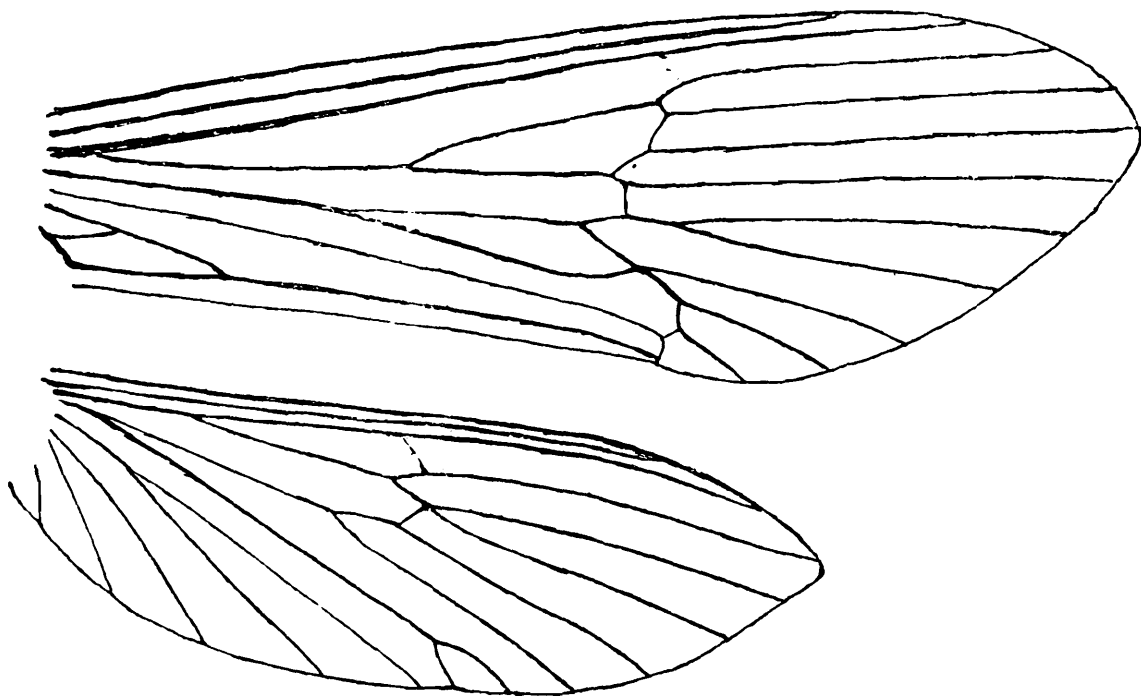
#### **Eothremma** Mart.

#### **Eothremma hindustana** sp. nov.

(Text-fig. 69.)

♀. Punjab, Punj-pul Nullah, about a couple of miles from Dalhousie, on Dalhousie-Bakloh Road, 6,500 ft., v.27; S. L. Hora.

Head blackish-brown, with distinct ocelli, behind which and the eyes are seen pale yellow stripes. Basal joint of antennae brownish, second very short, next two joints elongated, yellow.



TEXT-FIG. 69.—*Eothremma hindustana*, sp. nov., ♀; venation of wings.

Thorax dark-brown, portions of membrane uniting separate sclerites, pale; coxae brown, legs brownish yellow. Anterior wings

pale brownish, with brownish venation; venation resembling that of *Eothremma japonica* Mart., but discoidal and thyridial cells (text-fig. 69) are longer, fork 3 pedicellate, and CuA in its end portion is drawn towards  $M_3$ . In posterior wings M divides a little earlier than the division of RS, cross-vein rs-m longer, fork 5 is very short in *E. hindustana*, sp. nov.

Abdomen brown, but three posterior segments yellow above.

Length of body 5.5 mm.

*Remarks.*—Judging by the wing venation, *E. hindustana*, sp. nov. is evidently similar and allied to *E. japonica* Mart. from Japan. Thremminae is a relict subfamily with few genera and species; its representatives are very rare; therefore the discovery in N. India of the second species of *Eothremma* is very interesting; similar geographical distribution is met with in the genus *Limnacentropus* Ulm. (Phryganeidae).

## Family LIMNOPHILIDAE.

### **Phylostenax himalus** Mosely.

1935. *Phylostenax himalus*, Mosely, *Entomologist* LXVIII, p. 184 (Kumaon, Muktesar, 7,000 ft.).

2 ♂. Eastern Himalayas, Darjeeling district, C. Lynch.

These specimens were sent to Dr. Mosely who refers them to his new genus and species—*Phylostenax himalus* Mos. although he finds in them a slight variation.

I have before me also two females from Kalatope Hill, Dalhousie, Punjab (2.vi.27; S. L. Hora), which in wing venation and colouring closely resemble the above named males. I am inclined now to refer them also to *Ph. himalus* Mos. The formula of spurs in these females is 1.2.2. Although in his paper Dr. Mosely says (*l. c.* p. 184) that he is “unable to make out the spurs, as the legs . . . are much broken”, nevertheless in another letter he gives the formula of spurs as 1.2.2. If so, this coincides with the formula of spurs in two females from the Punjab, and I have, therefore, little doubt that these females belong to Mosely's species.

The structure of the male genital appendages in *Phylostenax himalus* is very similar to that of *Pseudostenophylax fumosus* Mart. Therefore, *Ph. himalus* may be considered as a species allied to the latter, although it differs in the formula of the spurs. As to the absence of scales in the posterior wings, I would add that the condition in the jugal and in inner portions of anal regions is rather different; in some species (*Ps. fumosus*) there is an area with scales, in others instead of scales there is a pouch (in jugal portion) with long thin hairs, and there exist species (*Ps. secretus* Mart.) in which such a pouch is lacking. In *Ph. himalus* there is a shallow pouch or concavity on the jugal portion, and it bears elongated hairs. Thus, as regards this character, there is no distinct difference between the genus *Phylostenax* Mos. and the genus *Pseudostenophylax*, and the only difference is in the formula of spurs.

**Pseudostenophylax** sp.

♀ Sikkim. Captain Dracott ; 1915.

This is a large, dark specimen. Anterior wings dark brownish, sprinkled with numerous pale rounded irrorations ; formula of spurs 1. 3. 4.

**Stenophylina** Mosely (1935, in litt.).

As the result of my examination of the specimen under description I came to the conclusion that it is representative of a new genus and species, allied to *Pseudostenophylax* Mart. and to *Drusus* Steph. I sent my figures to Dr. Mosely, who was studying at the time Indian Limnophilidae, and he wrote to me that he has described the same form under the name *Stenophylina mitchelli* Mosely and that his paper is in the press. I retain Mosely's names, but not having seen his description and figures, I give here my own description of the genus and the species :

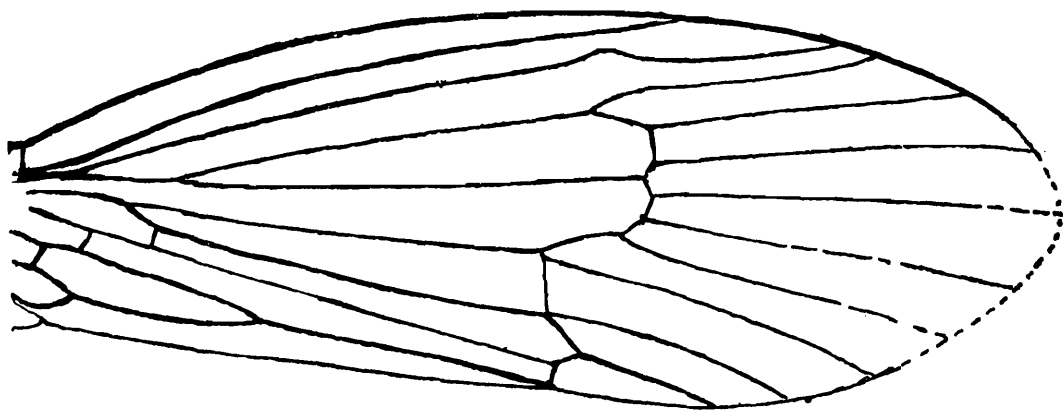
Resembling and allied to *Pseudostenophylax* Mart. and *Pseudohalesus* Mart. General form, as in these genera ; spurs 1.3.4. Anterior wings with strongly convex costal margin, without any basal folds ; in ♂ posterior wings jugal region (between  $A_3$  and inner edge of wing) much dilated and elongated, with inner margin straight and thickened, bearing short, curved hairs. Male genital appendages shaped as in *Drusus* Steph. and *Pseudohalesus* Mart.

**Stenophylina mitchelli** Mosely.

(Text-figs. 70-72.)

♂. North-Western Himalayas, Kashmir Valley, 5,000-6,000 ft., vi.13 ; F. Smith.

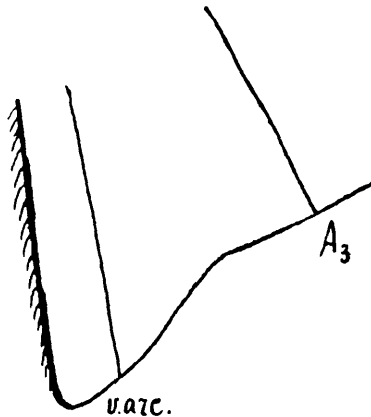
Head reddish yellow, antennae yellow, basal joint somewhat reddish ; thorax dark reddish yellow above, median stripe paler ; sides of the thorax pale brownish yellow ; legs yellow, spines black, spurs reddish, 1.3.4 ; last tarsal joint without spinules. Anterior wings greyish yellow somewhat darker and more cecaceous in the anterior portion, with dusky, greyish pterostigma ; spots lacking ; costal margin strongly



TEXT-FIG. 70.—*Stenophylina mitchelli* Mosely, ♂ ; forewing.

convex, arcuate ; discoidal cell very long, 1st apical cell a little impinging on it. Posterior wings pale greyish, with broad, large ano-jugal

portion; costal vein bearing series of long outstanding but slender hairs; discoidal cell not very long; jugal region broad and elongated,

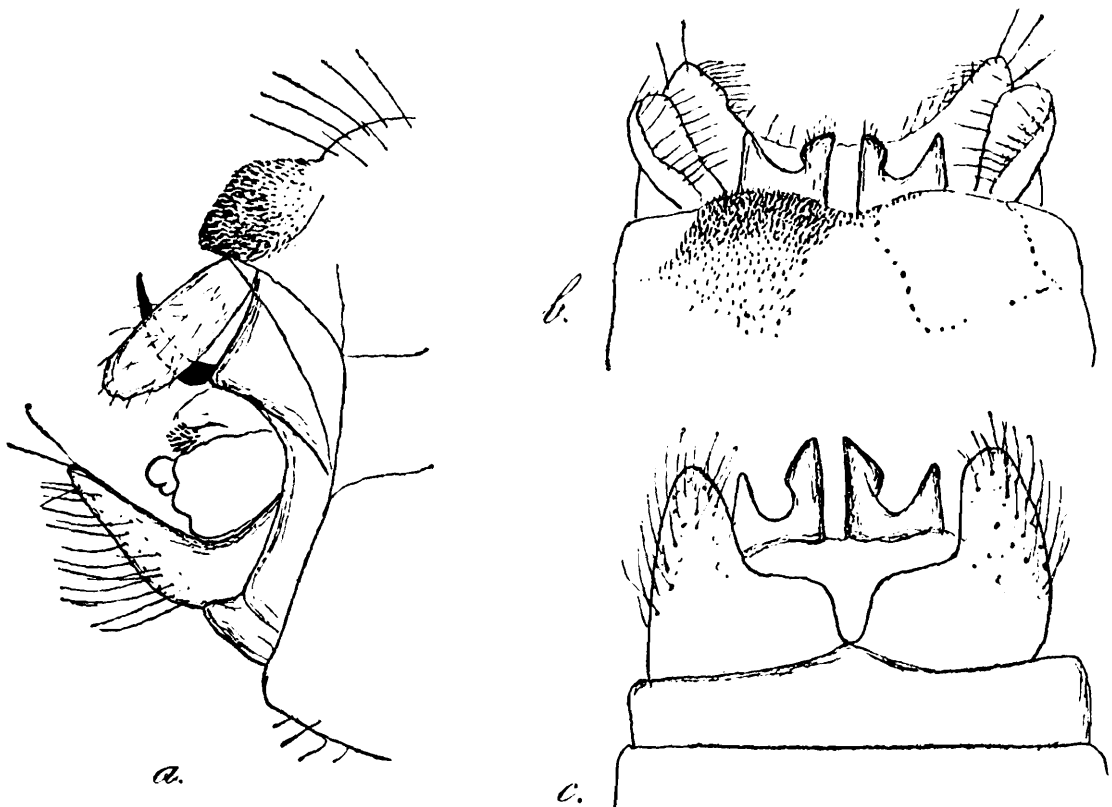


TEXT-FIG. 71.—*Stenophylina mitchelli* Mosely, ♂; inner posterior portion of the hind wing.

forming a distinct projection backwards<sup>1</sup>; its inner margin thickened and armed with series of short curved hairs; scales lacking.

Abdomen yellowish.

♂. 8th tergite covered behind with small black spinules, forming two blackish spots, connected behind with a slender stripe of spinules. 9th segment concave behind if seen from the side, but with a triangular projection above; preanal appendages elongated, pale, directed somewhat



TEXT-FIG. 72, a-c.—*Stenophylina mitchelli* Mosely, ♂; genital appendages from side (a), from above (b) and from beneath (c).

downwards, concave internally if seen from above. 10th segment represented with two short black plates, with rounded excisions each divided

<sup>1</sup> This projection resembles that in *Odontocerum albicorne* Scop.

into two processes, inner of which is longer and curved upwards, sickle-shaped from side; pedes genitales broad in the basal, twice narrower, tongue-shaped in the distal portion, which is separated from the basal by an angular excision of the inner edge; penis and titillators not exerted; end portion of penis thick, with irregular hindmargin.

Length of body 11.5 mm.

*Remarks.*—This species belongs, doubtless, to the group of *Pseudostenophylax-Drusus*, but differs mainly in the shape of posterior wings, in the somewhat coriaceous condition of anterior wings and in the absence of any spots on them.

### **Apatelina** gen. nov.

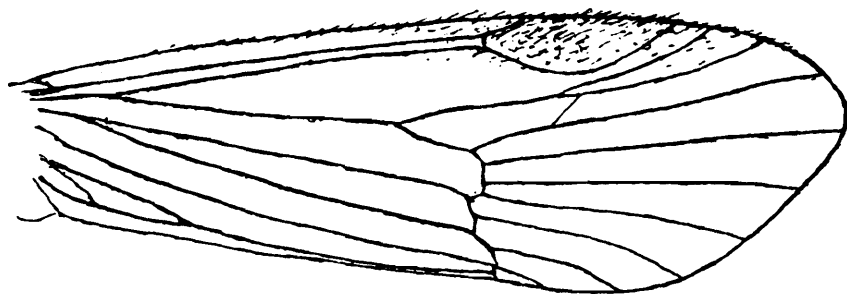
Allied to *Apatelia* Wall and *Apatania* Kol., but differing in the venation of anterior wings; pterostigma large, distinct, but subcosta ending on costa as in *Chilostigma* McLach., *Glyphopsyche* Bks. and allied forms; discoidal cell elongated, but shorter than its pedicel, closed with very oblique cross-vein; 2nd apical fork deeply impinging on DC, beyond its middle; 3rd apical fork broad at its base, sessile; 5th apical fork short.

### **Apatelina incerta** sp. nov.

(Text-fig. 73.)

♂. Defective specimen (without abdomen and hind wings; legs broken); India (exact locality not known).

Head brown, with brown hairs; antennae brown, with yellow annulations; maxillary palpi brown, third joint equal to the second, first joint very short; labial palpi short. Thorax brown above, somewhat paler at sides, anterior and median legs brownish; spurs 1.2 (posterior legs set off). Anterior wings greyish brown, clothed with brown pubescence; pterostigma darker; 1st apical fork acute at base, slightly



TEXT-FIG. 73.—*Apatelina incerta*, gen. et sp. nov., ♂; anterior wing.

impinging on DC;  $RS_4$  originating from  $RS_{3+4}$  at the base of 2nd third of the length of DC, nearly transverse at base; cross-vein  $rs-m$  and base of 3rd fork forming almost a transverse line; cubital fork short.

*Remarks.*—Judged by the venation of fore wings this species appears to be allied to and probably belongs to the subfamily Apataniinae, but it differs from the other genera, mainly in the shape of the discoidal cell. Posterior wings unfortunately not preserved.

*List of Trichoptera-Integripalpia from Continental India.*

Family CALAMOCERATIDAE.

- Ganonema brunneum* (Ulmer) Betten, *Rec. Ind. Mus.* III, p. 238 (1909)—Assam; other localities: Sumatra; Malay Peninsula.
- Ganonema salsum*, Betten, *Rec. Ind. Mus.* III, p. 238 (1909)—Upper Assam; also *antea*, p. 239—Darjeeling; Kumaon Hills; Assam-Bhutan Frontier; Gular.
- Ganonema longipenne*, Martynov, *Proc. Zool. Soc. London*, 1930, p. 85—Assam.
- Asotocerus fuscipennis* (Albarda) Betten, *Rec. Ind. Mus.* III, p. 239 (1909)—Kulu, W Himalayas; also *antea*, p. 241—Kumaon Hills; near Inlé Lake, Yawngnaw State; Palni Hills; other localities: Sumatra; Java; Annam; Malay Peninsula.
- Asotocerus flexuosus*, sp. nov., *antea*, p. 241—N. Kanara district.
- Asotocerus sinuatus*, sp. nov., *antea*, p. 243—Nilgiri Hills.
- Anisocentropus longulus*, Navas, *Ins. Orient. Mem. Pont. Accad. Rome*, (2) XVII, p. 105 (1933)—Burma.
- Anisocentropus kempi*, sp. nov., *antea*, p. 245—Castle Rock, N. Kanara district.

Family ODONTOCERIDAE.

- Marilia* sp., Betten, *Rec. Ind. Mus.* III, p. 239 (1909)—Bhim Tal, Kumaon.

Family MOLANNIDAE.

- Molanna* sp., *antea*, p. 249—Kanara district, Bombay Presidency.

Family LEPTOCERIDAE.

- Notanatolica magna* (Walker) Betten, *Rec. Ind. Mus.* III, p. 239 (1909)—Calcutta; also *antea*, p. 250—Calcutta; Chota Nagpur; Purneah district; Balighai, near Puri.
- Leptocerus marginatus*, Banks, *Proc. Ent. Soc. Washington* XIII, p. 105 (1911)—Pusa, Bihar.
- Leptocerus* (?) *indicus*, Walker, *Catal. Neuropt. Brit. Mus.* p. 72 (1852)—Bengal.
- Leptocerus distinguendus*, sp. nov., *antea*, p. 251—Rewa State (opposite the camp at Harra).
- Leptocerus forcipatus*, sp. nov., *antea*, p. 253—Rewa State (*ibid*).
- Parasetodes bakeri*, Banks, *antea*, p. 254—River Ganges, between Sakrigali and Manihari; Upper Burma; Pusa and Siripur, Bihar.
- Setodes postica*, Banks, *Proc. Ent. Soc. Washington* XIV, p. 104 (1911)—Bombay; Chapra, Bihar.
- Setodes lineata*, Banks, *Trans. Amer. Ent. Soc.* XXXIX, p. 237—Chapra, Bihar.

- Setodes argentifera*, McLachlan, *Journ. Linn. Soc. London* (Zoology), XI, 2nd Pt., p. 129 (1873)—India Septentrionalis; Betten, *Rec. Ind. Mus.* III, p. 240 (1909); also *antea*, p. 259—Pusa and Mokameh, Bihar.
- Setodes furcata*, Navas, *Rev. Acad. Cien. Zarag.* p. 37 (1932)—Khandala, Bombay.
- Setodes viridella*, Navas, *ibid.*, p. 38—Khandala, Bombay.
- Setodes inlensis*, sp. nov., *antea*, p. 254—Inlé Lake, Yawngghwe State; Balighai, near Puri; Bubak, Sind.
- Setodes unispina*, sp. nov., *antea*, p. 257—Purulia and Chakradharpur, Chota Nagpur.
- Setodes bimaculata*, sp. nov., *antea*, p. 261—Katihar, Purneah district, Bihar.
- Setodes tenuifalcata*, sp. nov., *antea*, p. 259—Sanjai River, Chota Nagpur.
- Setodes sternalis*, sp. nov., *antea*, p. 262—Rewa State (opposite the camp at Harra).
- Episetodes angustipennis*, gen. et sp. nov., *antea*, p. 265—Below Pharisemar, Rewa State.
- Trichosetodes composita*, sp. nov., *antea*, p. 263—Sanjai River, Chota Nagpur.
- Leptocella maculata*, Banks, *Proc. Ent. Soc. Washington* XIII, p. 104 (1911)—Pusa, Bihar.
- Oecetis bengalica*, sp. nov., *antea*, p. 266—Katihar, Purneah district, Bihar.
- Oecetis scutulata*, sp. nov., *antea*, p. 268—Rewa State (opposite the camp at Harra).
- Oecetis biramosa*, sp. nov., *antea*, p. 269—Balighai, near Puri, Orissa.
- Oecetis* sp. 1 (*jacobsoni* Ulm. ?), *antea*, p. 270—Lonton, W. shore of Indawgyi Lake, U. Burma.
- Oecetis* sp. 2, *antea*, p. 270—Kierpur, Purneah district.
- Oecetis* sp. 3, *antea*, p. 271—Calcutta.
- Oecetis* (*Oecetina*) *insignis*, Banks, *Proc. Ent. Soc. Washington* XIII, p. 104 (1911)—Bombay.
- Oecetis* (*Oecetina*) *pretiosa*, Banks, *Trans. Amer. Ent. Soc.* XXXIX, p. 237 (1913)—Chapra, Bihar.
- Oecetis punctulata*, Navas, *Rev. Acad. Cien. Zarag.* 4 ser., 14, p. 35 (1932)—Khandala, Bombay.
- Oecetis rufescens*, Navas, *ibid.*, p. 36—Khandala, Bombay.
- Setodellina indivisa*, sp. nov., *antea*, p. 272—Indawgyi Lake, U. Burma.
- Setodellina tenuis*, sp. nov., *antea*, p. 273—Rewa State (opposite the camp at Harra).
- Setodellina angustipennis*, sp. nov., *antea*, p. 274—Mokameh, Bihar.
- Setodellina mahadeva*, (Banks).—Chapra, Bihar; also *antea*, p. 276—Siripur and Purneah district, Bihar; near Indawgyi Lake, U. Burma.
- Triaenodes indica*, sp. nov., *antea*, p. 278—Kodaikanal, Palni Hills.



*Adicella biramosa*, sp. nov., *antea*, p. 279—Shillong, Assam.

*Mystacides indica*, sp. nov., *antea*, p. 280—Malwa Tal, Kumaon, W. Himalayas.

#### Family SERICOSTOMATIDAE.

*Goera relictata*, Betten, *Rec. Ind. Mus.* III, p. 240 (1909)—India (exact locality not known).

*Goera nigricornis*, Navas, *Rev. Acad. Cien. Zarag.* p. 39 (1932)—Khandala, Bombay.

*Goerodes* sp., Betten, *Rec. Ind. Mus.* III, p. 241 (1909)—Upper Assam.

*Dinarthrum ferox*, McLachlan, *Journ. Linn. Soc. London* (Zoology), XI, p. 118 (1873)—N. India.

*Dinarthrum* (*Indodinarthrum*) *punjabicum*, sp. nov., *antea*, p. 282—Punj-pul Nullah, Punjab.

*Dinarthrum* (*Indodinarthrum*) *latum*, sp. nov., *antea*, p. 283—Punj-pul Nullah, Punjab.

*Dinarthrodes inequalis*, sp. nov., *antea*, p. 284—Kumaon Hills.

*Dinarthrodes armata*, Ulmer, *Ann. Naturhist. Mus. Wien*, p. 69 (1905)—Assam.

*Dinarthrella betteni*, sp. nov., *antea*, p. 286—Darjeeling and Kurseong, E. Himalayas.

*Dinarthrella* (*Maniconeura*) *destruata*, Ulmer, *Notes Leyden Mus.* XXVIII, p. 28 (1906)—Darjeeling.

*Maniconeura indica*, sp. nov., *antea*, p. 289—Castle Rock, N. Kanara district.

*Paraphlegopteryx compositus*, sp. nov., *antea*, p. 291—Darjeeling district.

*Indocrunoecia heterolepidia*, gen. et. sp. nov., *antea*, p. 293—Darjeeling district.

*Ignasala fuscata*, Navas, *Rev. Acad. Cien. Zarag.* p. 40 (1932)—Khandala, Bombay.

*Eothremma hindustana*, sp. nov., *antea*, p. 296—Punj-pul Nullah, Punjab.

#### Family PHRYGANEIDAE.

*Eubasilissa* (Syn. *Neuronia*, *Holostomis*, *Regina*) *mclachlani* White, *Proc. Ent. Soc. London*, p. 26 (1861); McLachlan, *Trans. Ent. Soc. London* (3) V, p. 249 (1865-67)—India orientalis; Betten, *Rec. Ind. Mus.* III, p. 242 (1909)—Kulu; Darjeeling; Shillong, Assam; Martynov, *Proc. Zool. Soc. London*, p. 87 (1930)—Shillong, Assam; Darjeeling; Mosely, *Journ. Bombay Nat. Hist. Soc.* XXXVIII, p. 126 (1935)—same localities.

*Eubasilissa* (Syn. *Neuronia*, *Holostomis*, *Regina*) *regina* McLach. *Journ. Linn. Soc. London* (Zoology) XI, p. 103 (1873) (*Holostomus mclachlani*, var. *regina* McLach.); Ulmer, *Deutsch. Ent. Zeitsch.* III, pp. 339-340 (1908)—Kulu;

- Martynov, *Proc. Zool. Soc. London*, pp. 88, 111 (1930);  
 Mosely, *Journ. Bombay Nat. Hist. Soc.* XXXVIII, p. 125  
 (1935)—Kulu.
- Eubasilissa tibetana*, Martynov, *Proc. Zool. Soc. London*, p. 88  
 (1930)—Sikkim; Yatung; Mosely, *Journ. Bombay Nat.  
 Hist. Soc.* XXXVIII, p. 127 (1935)—Sikkim; Tibet.
- Oopterygia brunnea*, Martynov, *Proc. Zool. Soc. London*, p. 89  
 (1930)—Yatung; Mosely, *op. cit.*, p. 128—Yatung.
- Oopterygia asiatica*, Betten, *Rec. Ind. Mus.* III, p. 242 (1909)—  
 Sibsagar, Assam; Mosely, *op. cit.*, p. 128—same locality.
- Oopterygia minor*, Mosely, *Journ. Bombay Nat. Hist. Soc.*  
 XXXVIII, p. 128 (1935)—N. E. Burma, Kambaiti.
- Neurocyta arenata*, Navas, *Mem. Acad. Cienc. Art. Barc.* XII,  
 N. 13, pp. 240, 241 (1916); Mosely, *op. cit.*, p. 129—Dar-  
 jeeling.
- Agrypnia picta* (Kol.) *tibetana*, Martynov, *Proc. Zool. Soc. London*,  
 p. 91 (1930)—Tibet; Mosely, *op. cit.*, p. 130—Tibet  
 (probably occurs in N. Himalayas).
- Limnocentropus insolitus* (Ulmer) *himalayanus*, Martynov, *Proc.*  
*Zool. Soc. London*, p. 91 (1930)—Sikkim; Tsung-tang;  
 Mosely, *op. cit.*, p. 132—same locality.
- Limnocentropus fletcheri*, Mosely, *Journ. Bombay Nat. Hist. Soc.*  
 XXXVIII, p. 132 (1935)—Sikkim.

#### Family LIMNOPHILIDAE.

- Pseudostenophylax himalayanus*, Martynov, *Proc. Zool. Soc.*  
*London*, p. 92 (1930)—Tibet, Yatung; Sikkim, Khamba  
 Jong.
- Pseudostenophylax griseolus*, Martynov, *Proc. Zool. Soc. London*,  
 p. 97 (1930)—Sikkim, Khamba Jong.
- Phylostenax himalus*, Mosely, *Entomologist*, LXVIII, p. 184 (1935)  
 —Kumaon, Muktesar; also *antea*, p. 297—Darjeeling.
- Pseudostenophylax* sp., *antea*, p. 298—Sikkim.
- Stenophylina mitchelli*, Mosely, *antea*, p. 298—Kashmir.
- Halesinus albipunctatus*, Martynov, *Proc. Zool. Soc. London*, p. 98  
 (1930)—Tibet, Yatung.
- Platyphylax rufescens*, Martynov, *ibid.*, p. 105—Tibet, Yatung.
- Apatelina incerta*, gen. et. sp. nov., *antea*, p. 300—India.

Dr. M. Mosely has kindly informed me that he is describing several new Limnophilidae from India and that his paper is now in the press (12.xi.35).

#### SUPPLEMENT.

Addenda and Corrigenda to the 1st part.

#### 1. DESCRIPTION OF A NEW SPECIES OF RHYACOPHILIDAE.

##### **Allagapetus**, gen. nov.

In the anterior wings discoidal cell long, with but a short pedicel.

♂. 10th segment short, subdivided into paired lobes in its distal part; pedes genitales very long, with distal portions suddenly curved inwards (2nd joint); longer proximal parts bearing internally series of short spines.

Closely allied to *Agapetus* Court., but distinct. To it I refer two species—*Allagapetus* (*Agapetus*) *cocandicus* McLach. and *Allagapetus punjabicus*, sp. nov.

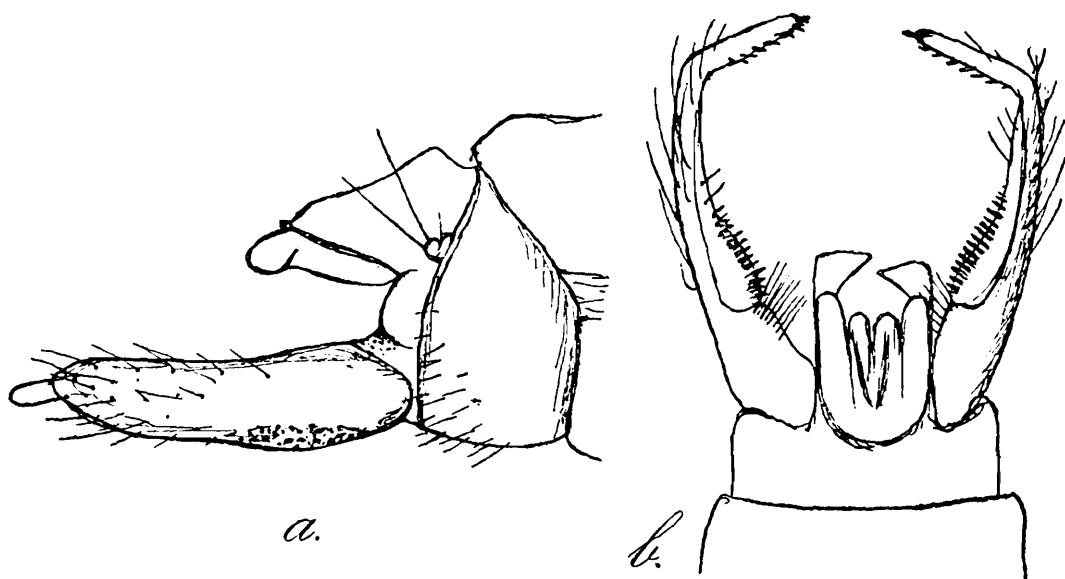
***Allagapetus punjabicus*, sp. nov.**

(Text-fig. 74, a-b.)

♂. Punjab, Punj-pul Nullah, about a couple of miles from Dalhousie, on Dalhousie-Bakloh Road, 6,500 ft., v. 27; S. L. Hora.

Head and thorax brown; side of thorax brownish, legs yellowish. Anterior wings pale greyish yellow; venation much resembling that in *Allagapetus cocandicus* McLach.; venation of posterior wings also resembling that in this species.

♂. 10th segment broad from side, narrowing backwards, short; seen from above it is subdivided into four lobes; behind and beneath from the outer lobes are situated two short pale projections, rounded from side, triangular from above. Preanal appendages very small, bearing but 2-3 long hairs. Pedes genitales long, band-shaped from side, each ending in a short slender appendage; seen from above they are more slender but dilated in their basal portion, which is armed internally with dense series of minute spinules; distal portion curved inwards and



TEXT-FIG. 74, a, b.—*Allagapetus punjabicus*, sp. nov., ♂; genital appendages from side (a) and from above (b).

also armed internally with several spinules; seen from the side it is more slender than the basal part; it represents the second joint, coalesced with the first; penis not exerted.

*Remarks.*—This species is evidently allied to *A. cocandicus* McLach. from Turkestan. Since these two species differ from *Agapetus* Curt. in

the venation of the fore wings and in the structure of the pedes genitales, they may be considered as representing a separate genus allied to *Agapetus*.

2. Some specific names in Part I proved to be *nomina praeoccupata* and have to be changed ; I propose to change *Rhyacophila pallida* (p. 100) into *Rh. horai*, nom. nov., *Oxyethira angustella* (p. 112) into *Ox. ramosa*, nom. nov., *Hydropsyche obscura* (p. 171) into *H. lobulata*, nom. nov. and *Hydropsyche tenuicornis* (p. 173) into *H. sagittata*, nom. nov. Moreover, it should be noted that *Cheumatopsyche processuata* Mart. is incorrectly referred to *Hydropsyche* (p. 175) ; it is indeed a species of *Cheumatopsyche*.

3. To my list of Trichoptera-Annulipalpia from Continental India have to be added 6 species, as follows :—

- i. *Stenopsyche pallidipennis*, Martynov, *Eos*, II, p. 297, figs. 22-24 (1926)—N. E. Assam.
- ii. *Stenopsyche himalayana*, Martynov, *Eos*, II, p. 298, figs. 25-27—N. E. Assam ; Baltistan.
- iii. *Dipseudopsis buddha*, Banks, *Trans. Amer. Ent. Soc.* XXXIX, p. 239 (1913)—Chapra and Pusa, Bihar.
- iv. *Nyctiophylax abrupta*, Banks, *Ibid.* p. 240—Chapra, Bihar.
- v. *Arctopsyche composita*, Martynov, *Proc. Zool. Soc. London*, p. 75, figs. 17-19 (1930)—Sikkim.
- vi. *Allagapetus punjabicus*, gen. et. sp. nov., *antea*, p. 305—Punj-pul Nullah, Punjab.